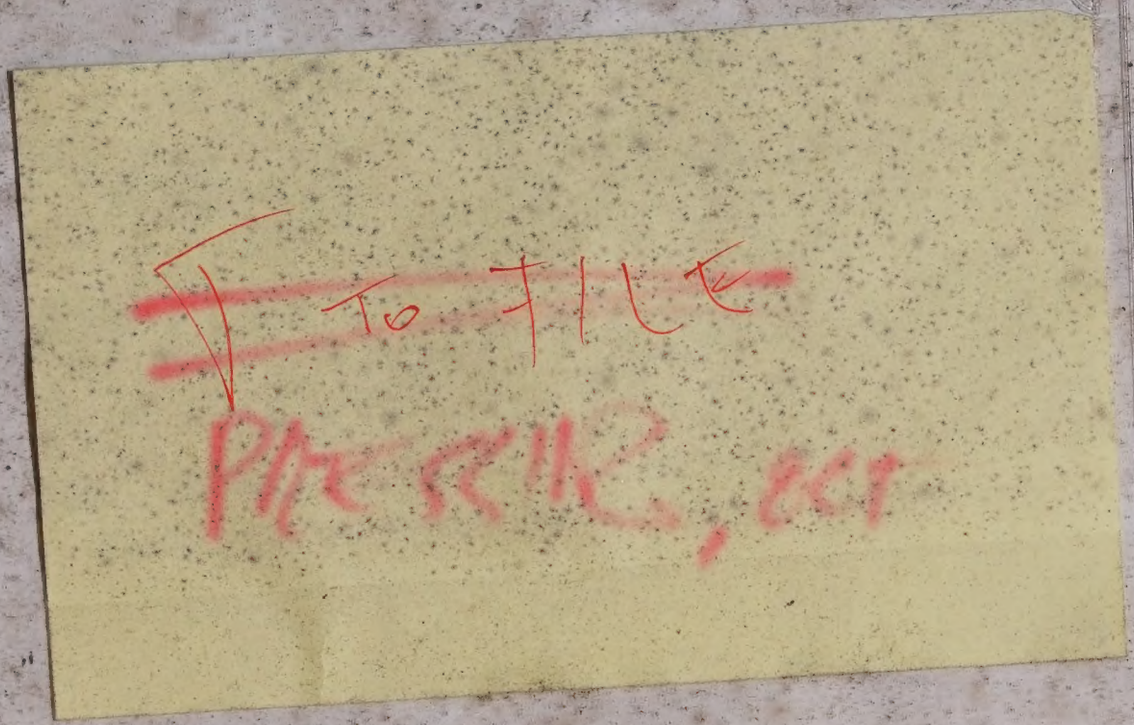
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THE ART OF CONNECTION, THE HEART OF REFLECTION, THE HOPE OF PERFECTION:
Hypermedia United, Literature Unified by Transclusion

(This is a PIECE REQUESTED BY COMMUNICATIONS OF THE ACM (Ed Bieber and Tomas Isakowitz, special editors).)
This is the long version, which must be cut drastically for their use; Ed Bieber originally asked me, two months ago, for a "one page feature on designing hypertext to augment human intellect." This first piece will now be cut down to the intended one page.

(Title for short version:)
THE HEART OF CONNECTION: Hypermedia United by Transclusion

Trans(c)1995 Theodor Holm Nelson, listed Xanadu.

Italics are indicated by CAPS, footnotes and citations by obvious methods.

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COUNTERPARADIGM _____ I can imagine few honors greater than a facing page to Douglas Engelbart's; he is one of the truly great men of our century and I love him dearly. Like Doug I have had a unified vision of which today's popular attainments are only centerless shadows of the edge.

Let me begin again, for few have understood. This is the first unified presentation of my work, adjusted to present terminology and controversies, but substantially as originally conceived (though now better underpinned theoretically). I am also de-emphasizing the won battles, such as simple hypermedia linkage.

I have till now had little basis for conversation with the computer mainstream. There has been a great expository problem, for which I have had to coin or import various terms (like hypertext, hypermedia, virtuality, visualization, transclusion). But few have even cared to hear my paradigm, simple but hard to explain, for it has clashed with the prevailing computer paradigms-- traditional hierarchicalism, iconic dumb-down, and AI tall tales. My work concerns rather a paradigm of DEEP INTERCOMPARISON OF RE-USE, with supporting visualizations and server mechanisms, on all scales, from personal work-settings to a proposed universal publishing system and its required copyright arrangement.

People asking "How does it feel to have your ideas come true?" reveal a dismaying gulf of misunderstanding. ALMOST NOBODY GETS IT! The center has not come true, only disconnected pieces, like personal computing, word processing, e-mail, newsgroups and forums, spaghetti hypermedia, World Wide Web. "Word processing" crushes all structure into a soup of bytes; tack-on hypermedia (such as HyperCard and Director) encourage spaghetti labyrinths; newsgroups and forums, with no stable literary availability, encourage grabbing the mike and flaming; World Wide Web, though wonderful, is a row of changeable shop-windows (with no stable publishing, no re-use and thus no intercomparison of re-use).

So let me use this venue to explain my real work.

BACKGROUND _____ From boyhood I saw the fundamental issues of life as freedom, creative control, and the erosion of knowledge and understanding.

Deeply alienated from the age of ten, I hated conventionality and Respectability (the suppression of creativity and feeling to avoid criticism). I loathed editors, committees and collaboration of any kind-- which required exhaustive enumeration and explanation of every conceptual nuance, thus limiting the number and depth of contemplated possibilities, wasting great effort in superfluous communication and persuasion, and reducing rich ideas to sha

dowy misimpressions.

My heroes at twelve were Buckminster Fuller, Bertrand Russell, Orson Welles and Walt Disney. I was determined to be a generalist, like Bucky. And even more than Bucky I believed everything was done wrong, from cars to clothing to houses to the system of marriage, but worst of all was the educational system.

All this was galvanized by my years at Swarthmore (Philosophy '59). I was not a political revolutionary but a design, social and systems revolutionary. My world was defined by writing, theater, film, science-fiction, philosophy and the social sciences.

I had certain deep concerns in the social sciences*bibl*HWetc.* and philosophy.*BIB2*P.Schem.* Foremost in my philosophical work was a concern with how to express the interpenetration and complexity of the world, with alternative descriptions, alternative theories and possibilities (greatly influenced by theoretical controversies of all kind and by the film "Rasho-Mon"). The center of my philosophical credo: "Nothing is just one thing." My religion: human creativity, inspiration, freedom and posterity; and good writing.

My plan after college was to be a rogue academic (like Fuller), writer, and independent film-maker. I believed that only the very wealthy or the very defiant could do things original or creative because of the stuffiness of the middle-class Respectability establishment. An ardent self-publisher and copyright holder, I was also deeply concerned about channels of distribution and archiving, since the Respectablity establishment conveniently hid or discarded all the alternative points of view.

But the fundamental problem I personally faced was how to manage many simultaneous projects. Intending to proceed on many fronts, I needed a way to handle all my projects in a massively parallel fashion.

It was with this background, then, that I faced, in graduate school, a computer course.

THE FIRST INSIGHT _____ As an abstract philosopher I recognized the computer first as philosophy equipment, which dealt with arbitrary abstractions; as a moviemaker I recognized it next as a presentational device. These insights taken together meant that the media of the future would be arbitrary interactive presentational constructs delivered on computer screens in an integrated media universe.

These media would be like other media, expressing human artistry and human viewpoints, but with extraordinary new powers in a variety of modalities, including on-the-fly dynamic graphics, stored sound and video. They would combine the old and existing media heritage (including poetry, plays, old movies, even paintings and sculpture) with our thoughts of tomorrow, newly presented in new ways, and delivered from servers world-wide in an all-digital network future. This extended down to a personal system one might someday have, for organizing everything from day-to-day lists to novels-in-progress to alternative organizations of vast hypermedia constructs.

I further imagined that a new generalist Renaissance would explode effulgently in this new media universe, once the stuffy jerks who kept the lid on were unseated.

THE HYPERMEDIA VISION _____ Then how would tomorrow's ideas be shown? In what new forms of interactive document?

Clearly interactive media would be a NEW MEDIA AND LITERARY UNIVERSE, the extension and fulfillment of all previous media and literature, indeed a huge revealed biological kingdom of media and literary genres, of which the kinds of media we had known-- the previously-discovered varieties of sequential text, recording and movie-- would turn out to have been only the smallest part.

Browsable and explorable like museums and diagrams, these looming hypermedia offered vast new possibilities of structure and of freedom. Indeed there could hardly be any invalid approaches, any more than there are invalid types of view and diagram. The only invalid approach would be to restrict freedom.

But given the end of sequence, what could be new guidelines in this new world? What would be the new methods and styles of exposition, theatrics, rhetoric? What new structures would facilitate expression, presentation, clarity, understanding, controversy, intercomparison? What media would be most viable?*bib3*DOM*

And structurally, what types of connections should there be?

But the most pressing immediate issues concerned my personal computer needs.

Clearly these ideas made possible a new, massively parallel project engine, suitable for all my own future writing and movies, greatly to simpify writing, filing, and the sharing of material between projects.

It was time to design.

VIRTUALITY AND INTERFACE _____ The styles of interaction could be many and varied, ranging from the lurid to the spatially abstract (a range scarcely fulfilled as yet.) This issue has been miscalled "human interface" (I believe I was the first person to hold a fanatical opinion on the subject of interfaces, a subject on which almost everyone has a fanatical opinion now.)

The term "interface" does not properly apply to interactive media. An object of bounded and well-defined functio

nality, such as a car, may be said to have an interface; but in such a sprawling zone of operations as computer m edia, function and its boundaries are technically indeterminate and controversial, so there is no defined functio nality to which any "interface" may be matched. The specification of boundaries and function is tantamount to a design and thus either arguable or a matter of taste.

The proper generalization of presentation is to generalize MOTION PICTURES*bib4*Cin.Mind*. I propose that such a generalization of movies is best called "virtuality," long in the dictionary as the opposite of "reality" (and n ot to be confused with the 3D rovings and interactive realism now popularly called "virtual reality," themselves a special case).

The functionalities of media are entirely concerned with ideas and with seeming. Virtuality is the art and scien ce of seeming, the general case of movie-making. Movies, the principal art of seeming, are events on a screen th at affect the heart and mind of the viewer; interactive software consists of events on a screen that affect the h eart and mind of the viewer, plus interaction. The design of the user's experience is the center. Thus interact ive software is a branch of cinema and the proper study for interactive software designers is movie-making. (The technicalities of programming, like operating a movie camera, are vital but irrelevant in their details to the d esign of the user's experience.) The design of virtuality is the design of conceptual structure and feel (corres ponding to script and atmosphere of movies)

My intended design would be, as far as the user's experience was concerned, without files and without hierarchy, and also without today's abominations of "application" and "metaphor." It would also be without interface in the above sense: designed as a universe, not an interface, a unified realm of thought and experience dealing only wi th media and their organization, and without extraneous concepts or artificial divisions.

I had many visual and interactive designs then, and have more now, but these issues became gradually pushed aside . It became clear that these were front-end issues, subsidiary to the main task of getting up a proper server.

THE GENERALIZED LITERARY PARADIGM

The other principal generalization of computer media is LITERATURE (itself alrady the persistent generalization o f media).

There were competitive ideas about, such as Information Retrieval, whose benefits I gradually doubted; Informatio n Retrieval was conventional stuffy thinking in a new guise. The idea of Information Retrieval was that document s could be dipped in some sort of technical acid and reduced to some set of "facts," which would fall to the bott om to be stored in a data base. This was woefully uncomprehending. All that is written has meaning, of some sor t, and carries a unifying point of view in a vital soft tissue of relationships, too easily purged by technical m eans. All documents have points of view; it cannot be otherwise. And the documents can be only partially unders tood without understanding these points of view.

So literature, in the broadest sense, may be defined as the connected system of documents and media objects, Thi s includes the shared space among the documents, where all viewpoints and paradigms may be expressed and maintain ed. Thus literature is the common ground of all viewpoints, the paradigm of all paradigms. Literature is the ev entual repository of all ideas, where they are represented not "objectively" but earnestly by those who hold them , as best they can. (Any alleged authority is simply another set of documents.) And literature is what lasts; a fter buildings crumble, documents remain. Literature is the nonphysical, informational, media heritage.

This literary model provides a set of moral criteria for the rights of the reader (or user). In Literature the a uthor does not imprison: YOU THE READER MAY OPEN ANYTHING AT ANY TIME; YOU THE READER MAY TURN THE PAGE, OR TURN TO THE LAST PAGE; YOU THE READER MAY USE THINGS TOGETHER; YOU THE READER MAY [sometimes] QUOTE FREELY. These pos sibilities might well be endangered, I thought, at the hands of those with insufficient sense of human freedom, t he human heritage, or the subtle interconnections of ideas and media.

How would these freedoms of literature best be passed on, and extended, to the new literature, the interconnected media objects of tomorrow?*bib5*FOI*

There were many other questions.

THE QUESTIONS

On the grand scale there were huge issues, political and philosophical, centering around freedom and re-use.

I was at once deeply concerned with freedom of expression, speech, publication, controversy and re-use. I sought these freedoms not just for myself but for everyone, especially minority views outside (and usually suppressed b y) the conventional. So how support self-publication? What about Preservation-- how would media objects (espec ially those expressing minority views) be preserved (and authenticated) when they were digital and swappable?

And how prevent the potential government information evils shown so presciently in Orwell's NINETEEN EIGHTY-FOUR and Bradbury's FAHRENHEIT 451? Would it be as they foresaw, that the natural information behavior of governments is censorship, suppression, disinformation? How much worse this might be in the digital future.

And perhaps most important, could we somehow contrive the deep-dirt survival of the human heritage (--and not jus t the records that governments want us to keep, either)? For libraries and museums are all too vulnerable, wheth er to small wars, terrorism or budget collapse.

THE KEY STRUCTURAL ISSUES

But structural concerns confronted me directly. What would be the structural units? And what types of connections would make the most sense? It was obviously vital to avoid special-case links, and seek the greatest generality possible, but what would that generality be, and in what direction would it lie?

On the personal scale, how would I design my own project engine? Tracking of writings and their re-use was important for anyone writing and re-using materials on even a medium scale, tracking excerpts, uses in letters and publications, and contemplated future uses. (One wanted to try variants and alternatives, designs and drafts, yet see always the original context, with easy comparison of their relationships.) How keep track of simultaneous different uses of the same material, and intercomparing those uses? What to do about item control and management, versioning and version management, cross-indexing? And what about deeper possibilities for organizational assistance-- especially ALTERNATIVE ORGANIZATIONS OF THE SAME MATERIALS, and viewing the alternatives?

On the megascale, the questions were oddly similar. HOW WOULD THE NEW LITERATURE BE DEFINED?

How would people be able to connect their media objects to those already published? For being able to tie everything together, according to different points of view, was a principal problem of this integrated media universe. As I saw it, everything ought to be annotatable, interweavable and reworkable by anyone (a proposed world others do not yet understand). Thus the question was, How lay out ground rules for INTERCONNECTABLE MEDIA OBJECTS, allowing commentary and other interconnection?

On the one hand, what about intellectual property: How would ownership-- that is, copyright-- be managed? On the other hand, what about QUOTATION AND COPYRIGHT in electronic publishing? How could materials all be re-used in the ways people needed to re-use them? This re-use issue was special. But then how in the integrated media universe that was to come would we avoid the godawful permissions problem-- which was literally part of the meaning of "copyright"?

But in all cases, from personal documents to large-scale publishing, the principal issue seemed to involve re-use and intercomparison.

THE PIVOT

In three frenetic months of computer thinking this cloud of considerations condensed into a single crystal pivot, the center of my work since that time. By the end of 1960, three months after my computer course began, I had a design, a paradigm, a doctrine, a scheme for world liberation. It has been the basis of my work since then, and any other approach seems to me confused and warped. It showed me how we might have simultaneous different uses of the same material (often in variant drafts and designs)-- and in publication.

This central idea was what I now call TRANSCLUSION, which provided a sweeping solution. Simply stated, this idea meant RE-USE AND INTERCOMPARISON OF RE-USE: SIDE-BY-SIDE COMPARISON of PIECES WHICH RETAINED THEIR ORIGINAL IDENTITY, so that original context would always be recognizable.

Transclusion did not mean conventional copy or transfer of bytes, whereby they lose their identity; it meant IDENTIFIED RE-USE FOR INTERCOMPARISON, keeping all the re-used pieces separate and identified as to their origins, so that each item would have a pathway back to its original. These pathways provide bridges of context-- between the new and original context-- for viewing and other purposes. All instances of the same material would be linked sideways, as it were, so they could be viewed together sideways, as it were, showing all the uses of any item. And a reader would essentially purchase an item, or a portion, thus retaining both that piece and the pathway to its original context, for possible later use.

There are many ways of viewing transclusion; here are two.

pic: H-Viewing & transpointing windows

What I call H-Viewing, the simplest form of transclusive intercomparison, simply shows the same chunk or paragraph used in two different sequential contexts. The second, windows with internal counterpart pointing, have pointers between their interiors, which scroll or writhe appropriately with the shifting contents of the windows. (This to me has been a fundamental visualization for decades*bib6*AWWT*; to me, all today's windowing systems are alike, since they do not allow this fundamental structure.)

My current definition of transclusion: EMBEDDED INSTANCE with ORIGINAL IDENTITY MAINTAINED and ORIGINAL CONTEXT AVAILABLE AND VIEWABLE. An embedded instance, virtually a part of its new context, would still retain its identity, and its path back to the original, and could in principle be supplied from the same portion on disk.

This provided: a method by which you the author could track different uses of your own material; a method for optimizing re-use (e.g. partitioning material into different chapters); a method for viewing versions side-by-side, seeing for each portion the original context; (thus helping to understand material through its different context, and conversely understanding different contexts through their shared material); a method for quotation showing both the new context and the original context; a method for sale of quoted material providing precise proportional royalty to the orignal publisher, providing a pathway back to the original, and providing credit to the originator; a method for publishers to track re-uses of their published materials.

PROJECT XANADU: THE CENTRAL IDEA _____ This central idea, RE-USE WITH INSTANCE COMPARISON, meant creating a generalized server to make intercomparison the center of everything, OF AL L DIGITAL FUNCTION.

While the project was designed from the beginning as a single-user system, an engine for the managing of personal rework and intercomparison, that did not mean it was a small-scale system, since it would have to deal with the maintenance of massively parallel intellectual and creative projects which shared material.

It would be HYPERARCHICAL, that is, permitting the same material to be organized at the same time with simultaneo us alternative sequences, hierarchies, structures. These would not be treated as contradictory but rather as SUP ERCOMPLETE.

It could also be a system for workgroups, sharing material and carrying it forward into new interweavable and int ercomparable constructions under individual and joint authorship.

And indeed, this same concept could scale up directly to a mighty publishing system, for we may think of the worl d's work as a massively parallel intellectual and creative project under decentralized management.

This my main computer project (called since 1967 XANADU*) has always been an INTEGRATED CONCEPT, centering on THE PARALLEL INTERCOMPARISON OF IDENTIFIED RE-USE and its uses both for personal work environments (managing private versions) and for hypermedia publishing-- that is, all publishing-- with a matched copyright doctrine of sharabl e re-use.
*----- *"Xanadu" is a registered trademark of Project Xanadu.

The Xanadu concept is simple but rich, and it has always addressed, explicitly, implicitly or by doctrine, most o f the digital media issues that are now in such wide circulation.

Xanadu was from the beginning intended to be:

1) A single-user environment re-work and intercomparison environment, for project revision, deep version managem ent, and side-by-side viewing of version alternatives. All edits were to be by addition; no keystrokes would eve r be deleted, all changes to be managed by the historical system. (This was okay for text, since you could type all your life and only fill a few disks.)

The first methods I came up with are now called "logging system" (a system that changes continually by new additi ons), "monotonic storage" (a storage system that acquires without deletion or overwrite), and "delta list" (log o f changes that can be re-played and reversed for historical stepping, backtrack and revision; however, mine had a modifiable treelike structure).*bib8*rev.tree* Note that two of my early design features for personal text hand ling, non-losable item control and thread management, had the distinction of being thrown out of the first visual word processor project.*bib7*Htextfor360*

Structure would have to be separate from bytes to facilitate re-use and quotation. (This system of managing stru cture on an applicative basis meant avoiding embedded codes, like those of such later developments as link anchor s, HTML or Microsoft Word.)

2) Beneath that, a networkable server to manage changing, re-usable hypertext and hypermedia contents and struct ure, including: (a) Edit changes among versions, (b) Links visible from the citing and cited end (bivisible), (c) Quoting re-uses (transclusions).

3) A many-to-many, populist, anarchic publishing system using these servers, designed for universal instantaneou s access and open publication by all, with copyright handled automatically, under a precisely-defined implementat ion method and a precisely-defined business method.

4) An extension to the doctrine of copyright, intended to free all materials for such unrestricted on-line quota tion and republishing.

5) A vehicle for new, highly generalized literary forms:

(a) COLLATERAL HYPERMEDIA, meaning materials intended for side-by-side presentation showing links and transclusi ons (as in the interior-linked counterpart windows, shown earlier).

(b) Possibly the most general hypermedia form, THE HYPERPLEX: a complex of information wherein everything is sto red in its "full correct" structure, with all relationships represented by links and transclusions (or in case of doubt, ALTERNATIVE VERSIONS of its correct structure).

Any "organization" applied to such a hyperplex would simply be a substructure of the whole, having applicative co ntrol of the whole in a certain context or subdocument. The task of organizing such a hyperplex, then, would not be the deletion of alternatives or lightly disfavored materials, but the highlighting and headlining of substruc tures. (My principle hypothesis of hypertext-- the HYPERTHESIS-- has been that correctly representing such a str ucture is the principal task of exposition and teaching by hypertext, and makes both the preparation of materials , and their use, easier for all parties. There has as yet been no way to test this conjecture.)

(c) Implicitly, a new kind of distributed collateral literature (which I now call TRANSMEDIA*) for multi-author media developed in such an environment of transclusive intercomparison. Such a medium will allow different autho rs and publishers to combine their contributions in an orderly conglomerate-- with interweavable constructions, o verlapping layers and interpointing and interpenetrating materials-- through its clean basic system of order. (N ote that this model of interpenetrating contributions among semiclosed media packages is still very different fro m the prevailing paradigms of hypermedia publishing even today.)
*----- My special thanks to Professor Yuzuru Tanaka, who originally published the term "transmedia," for approvin

g my adaptation of the term to refer to such transclusive meta-hypermedia. ----*

THE PERSONAL PROJECT ENGINE _____ First of all this would be a personal revis ion server and project tracker for myself (and other writers and scholars-- but there was no point asking what th ey wanted in those days). It would manage and track re-use with instance comparison in all projects and publicat ions, from sequential text on up; indeed, it would allow HYPERARCHICAL structure, with the same material organize d at the same time with simultaneous alternative sequences, hierarchies, structures; especially parallel overlapp ing hypermedia projects and alternative organizations for them.

This, the ideal working system, meant being able to try many possible organizational strategies and feints, with nothing lost or mislaid. Indeed, no valid material need be deleted, as so often in conventional writings; but he re, NO CONNECTIONS NEED BE CUT. Why should expository connections be lost, when they can be merely RELEGATED? T his meant completion without deletion, resolution without relinquishment, and the remission of the deadline syste m, since there would always be a current integral version of everything. Thus work could unfold in its unified f ullness. Since each change would propagate to all its relevant contexts, everything would stay up to date.

Expecting to use this myself, shortly, I projected the unification of my life's writings into a single huge paral lel transclusive hypertext, constantly evolving on all sides, in all crevices. This my OEUVRE, nicknamed "Irv," would be not a collection of documents but a unified edifice of ideas in a new and comprehensive literary genre. There would be in this complex no individual Projects, merely slices of the whole which had subcoherence and mad e sense independently, occasionally to be sliced off, separated (but not severed) for publication.

No longer damned, like other authors, to the vicissitudes of short-term pressures (since there would always be a current version, in clean state with all connections fully resolved, to throw to hungry editors), I would have a literary development tool which extended the parallel cut-and-paste methods of Thoreau and Tostoy to a culminatio n of which they never dreamt.

And it would facilitate self-publishing of every kind.

THE PROSPECTIVE GRAND PUBLISHING SYSTEM _____ Further, the global publishing system n eed be in its structure no different from the one-person system-- MANAGING RE-USE WITH INSTANCE COMPARISON-- exce pt that it had to be distributed, and manage the distributed detached proportional royalty system I had come up w ith.

Anyone could publish freely, of course. But then anyone could REpublish freely, fo each republished piece would be a tracked instance of the original.

But the republisher would just make a pointer. Users, not publishers, would pay royalties, based on what they re ceived, each piece being paid to the original publisher.

Authors with many points of could freely re-use each others' material hyperarchically, organizing them in simulta neous alternative sequences, hierarchies and other structures, (just as in the single-user system); these structu res would now be understood to be different documents, with different points of view, under different organizing ownership (though quoted bytes remained owned by their original publishers).

These grand-scale publishing servers would of course be more difficult to program than the single-user system. T he scheme meant distributed server machines, distributed copies of documents (and their distributed update). And it meant a global scheme for assuring bivisible connections among documents, so that each document could see whi ch others pointed at it or quoted it. This would be particularly difficult.

And this could indeed become the crowning system of literature, to engender a whole new flowering of knowledge an d humanism.

CAPSULE XANADU HISTORY _____ I undertook this project alone with little ho pe of explaining it to others; but as it persevered into the 1970s and beyond, a few brilliant people have unders tood and worked hard for the idea.*FTNT*
*----- *Noting only special technical contributions, I must name (in chronological order), John Ridgway, Cal Dani els, William Barus, Roger Gregory, Mark Miller, Eric Hill, Roland King, K. Eric Drexler, Michael McClary, Dean Tr ibble and Ravi Pandya. -----*

Partly from a deep mistrust of pompous nonprofit auspices, Xanadu has ALWAYS been a commercial project, intended from its inception to become a literary and hypermedia distribution system "franchised like McDonald's" (a chain which was itself far smaller in 1960). More specifically, the planned network has been intended as a licensed ne twork of servers and stands under independent local ownership with unified policy and a high grade of well-define d, reliable service.

After the project was dropped by Autodesk, the "Xanadu" trademark was returned to me personally while the latest fine-grain server remains under low-budget development by Roger Gregory at XOC, Inc. and elsewhere.

XANADU SERVER DESIGNS _____ Xanadu has a long history of partial server implementations, interesting both historically and as computer science.*ftnt*

---- Unfortunately a number of trade secrets of the project are still under wraps, owned by XOC, Inc. and variou sly licensed. Some but by no means all of our special algorithms have since been discovered and published by oth ers, as long as twenty years after our discovery of them, but where they are published is part of the trade-secre t package. ----

Under continuous development since the fall of 1960, the technical side of the Xanadu project has been a series o f server designs to support transclusive re-use, intercomparison, and of course other hypermedia functions, both for personal use and as a publishing network. The history through 1988 is in a book.*bib7*LM* After 28 years on shoestrings, substantial funding was provided by Autodesk, Inc., from 1988 to 1992 and then dropped.

Concretely, about half a dozen server designs have been implemented to various degrees, some completed but (for p olitical reasons) never tested or marketed. A group assembled in 1979 designed an extraordinary server for both the one-person and the distributed publishing system. This server was completed in 1988. A redesign*bib8*XOC.DO C* continued until funding ended. These last two servers ("88.1" and "The XOC Server") were remarkably designed fine-grained connection-tracking mechanisms for rework and comparison, scalable to large networks. These were es sentially readdressing boxes, translating from arbitrary version addresses to original storage addresses and vice versa.

The main differences among Xanadu server designs have had to do with:

1. Scale-up (early designs did not).

2. Granularity, especially editability of embedded instances. My 1965 design*bib9*FSCCI* dealt with fixed chunk s; the fine-grained server designs of the 1980s maintained transclusion with down-to-the-byte editability.

3. Mechanisms of transclusion: I originally used simply a type of link pointer, as many still do; the later fine -grained Xanadu servers handled transclusion by very elegant intrinsic mechanisms.

4. Mechanisms of versioning, an outgrowth of mechanisms of transclusion (3, above).

5. Increasing varieties of link types, the later versions having open-ended sets of link types (and attaching li nks to spans of bytes rather than embedded "anchors").

6. Separable transclusion of bytes and structural members.

7. Transvisibility, or the ability to reach different transcluded instance portions from the original or from on e another.

(PIC)

As a design issue, transvisibility represents one of the greatest differences among transclusive servers. The ea sy case is transvisibility between an instance and its original; the hardest case is transvisibility among all in stances, transcluded to separate documents. Different server designs provide different degrees of transvisibilit y. All transcluded copies on any servers can of course reach the original.

This visibility was possible in varying degrees in the different Xanadu designs; the last two server designs impl emented total all-version transvisibility to the byte level, no mean feat.

This has important consequences for what kind of a media world can be built. DEEP transmedia, showing arbitrary shared transclusions between works, essentially require strong transvisibility.

THE BIG RETHINK _____ In the difficult time since the loss of funding fro m Autodesk, it was incumbent upon me to rethink what the center of Xanadu really was, and perhaps find a way of s eparating it into parts. Xanadu had always been to me a totally unified concept-- a coordinated revision structu re of transclusion, linkage and intercomparison that I have frequently called the most fundamental tool of human thought. Thus rethinking it into separable parts was a daunting task.

The basic grand objective of the Xanadu system was always to provide an enabling technical platform, commercial a nd legal system for an interpenetrating literature of freely-weaving transmedia. But could this be accomplished piecemeal?

New models appeared that surprised me. It turned out that a number of layers could be distinguished clearly. Se veral levels of implementation were distinct: the single-user project tracker engine with edit changes, the publi cation server, and the publication server network, could all be different devices or programs. (Indeed, they cou ld all use or more than one technology at the same time.) The publication model and the legal system were at sti ll further removes of abstraction.

There were some megaproblems of the large-scale publishing docuverse (for which technical solutions had been desi gned into our later servers), notably:

1. Sacrificing detailed edit tracking meant loss of transvisibility among versions, since the edit changes coupl ed the transclusions of the same bytes among separate versions. The coupling of those transclusions kept links t o old bytes punching through to new versions. This was a regrettable loss, but had only been part of the late mo del servers. Relinquishing that part makes server design all much simpler, still preserving the key aspects of t he original publishing model.

2. The problem of connection bivisibility across the whole docuverse, network coordination to arrange that you c ould not only reach the original from a document which had made a connection to it, but you could reach all the d ocuments which pointed to any original.

(PIC)

But these concerns, it turned out, might be transmuted into an economic rather than technical matter: transvisibi lity and bivisibility could be PAID FOR, and some method of lesser complexity used, such as relational database. Since the server system could not maintain these connections without an expenditure of resources, why not let th e connecting publishers pay for maintaining each connection? This approach is among the new Xanadu techniques.

TRANSPUBLICATION: A SYSTEM OF PERMISSIONS _____ The publishing doctrine of sharable re-use, p reviously tied to technicalities, turned out to be totally independent of any particular implementation.

Xanadu publishing was always intended to be an ever-quotable publishing system of interpenetrating distributed li terature, freeing all materials for on-line republishing, without special arrangement, in quotations, anthologies and collages, while always paying royalty to the original publisher (and interfering with no other systems of co pyright, on-line or off). Turning out to be quite separate from any implementation, this had always really been a legal and business model, with a specific permission system on the bytes.

I am now promulgating this separately from Xanadu, free for all, as the "transcopyright" permission arrangement.* bibl0*transpub* (It requires SOME implementation, to be sure, but none on the levels of intricacy the Xanadu pro ject has attempted.) This copyright permission system, always implicitly a part of the design, requires that all material be re-usable out of context without oversight by the copyright holder. Thus a copyright owner relinqui shes context control of all materials and receives appropriate royalty on all instances sold.

Any republisher has permission to embed material in whatever new contexts. However, the republisher may only tra nsmit stripped-down versions, with pointers representing the quoted materials to be embedded in these new context s. Each recipient purchases the quotations (text, video, music, etc.) anew from the original publisher, and ret ains the quotations' original addresses, thus maintaining the accessibility of each original context and intellec tual credit to each original author.

This specific permission cluster, affecting on-line publishing only, is symbolized by the word "trans" in front o f the ordinary copyright notice.

END _____ "Xanadu" lives on now in more open and flexible for m, freed from implementation commitments: as a registered trademark, a publishing doctrine*bibll*pub.doct* for th e intended interpenetrating literature, and a set of specifications for software that will fit this publishing mo del*bibl2*Xanspecbook*, intended to guide the assembling of new Component Xanadu software from pieces on the open market.

Like Doug Engelbart, I slog on with ideals held high above the mud. A principal parallel between Doug's work and mine is the gap between breadth of intent and the narrowness of popular implementations. But more telling is th e irony that Doug and I started from completely opposite premises: he to empower work groups and make them smarte r, I to free the individual from group obtuseness and impediment. That Doug and I have converged on common ideas to any degree is astonishing, and shows, I think, the correctness and the generality of the ideas. Characterist ically, Doug wants to set up a committee and I want to continue to think things out in private. And neither is w rong, in this pluralistic world that still needs vastly better tools for groups AND individuals.

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COUNTERPARADIGM

I can imagine few honors greater than a facing page to Douglas Engelbart's; he is one of the truly great men of our century and I love him dearly. Like Doug I have had a unified vision of which today's popular attainments are only centerless shadows of the edge.

Let me begin again, for few have understood. This is the first unified presentation of my work, adjusted to present terminology and controversies, but substantially as originally conceived (though now better underpinned theoretically). I am also de-emphasizing the won battles, such as simple hypermedia linkage.

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People asking "How does it feel to have your ideas come true?" reveal a dismaying

dismaying gulf of misunderstanding. ALMOST NOBODY GETS IT! The center has not come true, only disconnected pieces, like personal computing, word processing, e-mail, newsgroups and forums, spaghetti hypermedia, World Wide Web. "Word processing" crushes all structure into a soup of bytes; tack-on hypermedia (such as HyperCard and Director) encourage spaghetti labyrinths; newsgroups and forums, with no stable literary availability, encourage grabbing the mike and flaming; World Wide Web, though wonderful, is a row of changeable shop-windows (with no stable publishing, no re-use and thus no intercomparison of re-use).

So let me use this venue to explain my real work.

BACKGROUND

From boyhood I saw the fundamental issues of life as freedom, creative control, and the erosion of knowledge and understanding.

Deeply alienated from the age of ten, I hated conventionality and Respectability (the suppression of creativity and feeling to avoid criticism). I loathed editors, committees and collaboration of any kind-- which required exhaustive enumeration and explanation of every conceptual nuance, thus limiting the number and depth of contemplated possibilities, wasting great effort in superfluous communication and persuasion, and reducing rich ideas to shadowy misimpressions.

My heroes at twelve were Buckminster Fuller, Bertrand Russell, Orson Welles and Walt Disney. I was determined to be a generalist, like Bucky. And even more than Bucky I believed everything was done wrong, from cars to clothing to houses to the system of marriage, but worst of all was the educational system.

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I had certain deep concerns in the social sciences*bib1*HWetc.* and philosophy.*BIB2*P.Schem.* Foremost in my philosophical work was a concern

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My plan after college was to be a rogue academic (like Fuller), writer, and independent film-maker. I believed that only the very wealthy or the very defiant could do things original or creative because of the stuffiness of the middle-class Respectability establishment. An ardent self-publisher and copyright holder, I was also deeply concerned about channels of distribution and archiving, since the Respectablity establishment conveniently hid or discarded all the alternative points of view.

But the fundamental problem I personally faced was how to manage many simultaneous projects. Intending to proceed on many fronts, I needed a way to handle all my projects in a massively parallel fashion.

It was with this background, then, that I faced, in graduate school, a computer course.

THE FIRST INSIGHT _____ As an abstract philosopher I recognized the computer first as philosophy equipment, which dealt with arbitrary abstractions; as a moviemaker I recognized it next as a presentational device. These insights taken together meant that the media of the future would be arbitrary interactive presentational constructs delivered on computer screens in an integrated media universe.

These media would be like other media, expressing human artistry and human viewpoints, but with extraordinary new powers in a variety of modalities, including on-the-fly dynamic graphics, stored sound and video. They would combine the old and existing media heritage (including poetry, plays, old movies, even paintings and sculpture) with our thoughts of tomorrow, newly presented in new ways, and delivered from servers world-wide in an all-digital network future. This extended down to a personal system one might someday have, for organizing everything from day-to-day lists to novels-in-progress to alternative organizations of vast

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I further imagined that a new generalist Renaissance would explode effulgently in this new media universe, once the stuffy jerks who kept the lid on were unseated.

THE HYPERMEDIA VISION

Then how would tomorrow's ideas be shown? In what new forms of interactive document?

Clearly interactive media would be a NEW MEDIA AND LITERARY UNIVERSE, the extension and fulfillment of all previous media and literature, indeed a huge revealed biological kingdom of media and literary genres, of which the kinds of media we had known-- the previously-discovered varieties of sequential text, recording and movie-- would turn out to have been only the smallest part.

Browsable and explorable like museums and diagrams, these looming hypermedia offered vast new possibilities of structure and of freedom. Indeed there could hardly be any invalid approaches, any more than there are invalid types of view and diagram. The only invalid approach would be to restrict freedom.

But given the end of sequence, what could be new guidelines in this new world? What would be the new methods and styles of exposition, theatrics, rhetoric? What new structures would facilitate expression, presentation, clarity, understanding, controversy, intercomparison? What media would be most viable?*bib3*DOM*

And structurally, what types of connections should there be?

But the most pressing immediate issues concerned my personal computer needs.

Clearly these ideas made possible a new, massively parallel project engine, suitable for all my own future writing and movies, greatly to simpify writing, filing, and the sharing of material between projects.

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VIRTUALITY AND INTERFACE

The styles of interaction could be many and varied, ranging from the lurid to the spatially abstract (a range scarcely fulfilled as yet.) This issue has been miscalled "human interface" (I believe I was the first person to hold a fanatical opinion on the subject of interfaces, a subject on which almost everyone has a fanatical opinion now.)

The term "interface" does not properly apply to interactive media. An object of bounded and well-defined functionality, such as a car, may be said to have an interface; but in such a sprawling zone of operations as computer media, function and its boundaries are technically indeterminate and controversial, so there is no defined functionality to which any "interface" may be matched. The specification of boundaries and function is tantamount to a design and thus either arguable or a matter of taste.

The proper generalization of presentation is to generalize MOTION PICTURES*bib4*Cin.Mind*. I propose that such a generalization of movies is best called "virtuality," long in the dictionary as the opposite of "reality" (and not to be confused with the 3D rovings and interactive realism now popularly called "virtual reality," themselves a special case).

The functionalities of media are entirely concerned with ideas and with seeming. Virtuality is the art and science of seeming, the general case of movie-making. Movies, the principal art of seeming, are events on a screen that affect the heart and mind of the viewer; interactive software consists of events on a screen that affect the heart and mind of the viewer, plus interaction. The design of the user's experience is the center. Thus interactive software is a branch of cinema and the proper study for interactive software designers is movie-making. (The technicalities of programming, like operating a movie camera, are vital but irrelevant in their details to the design of the user's experience.) The design of virtuality is the design of conceptual structure and feel (corresponding to script and atmosphere of movies)

My intended design would be, as far as the user's experience was concerned, without files and without hierarchy, and also without today's abominations of "application" and "metaphor." It would also be without interface in the above sense: designed as a universe, not an interface, a unified realm of thought and experience dealing only

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I had many visual and interactive designs then, and have more now, but these issues became gradually pushed aside. It became clear that these were front-end issues, subsidiary to the main task of getting up a proper server.

THE GENERALIZED LITERARY PARADIGM

The other principal generalization of computer media is LITERATURE (itself alrady the persistent generalization of media).

There were competitive ideas about, such as Information Retrieval, whose benefits I gradually doubted; Information Retrieval was conventional stuffy thinking in a new guise. The idea of Information Retrieval was that documents could be dipped in some sort of technical acid and reduced to some set of "facts," which would fall to the bottom to be stored in a data base. This was woefully uncomprehending. All that is written has meaning, of some sort, and carries a unifying point of view in a vital soft tissue of relationships, too easily purged by technical means. All documents have points of view; it cannot be otherwise. And the documents can be only partially understood without understanding these points of view.

So literature, in the broadest sense, may be defined as the connected system of documents and media objects, This includes the shared space among the documents, where all viewpoints and paradigms may be expressed and maintained. Thus literature is the common ground of all viewpoints, the paradigm of all paradigms. Literature is the eventual repository of all ideas, where they are represented not "objectively" but earnestly by those who hold them, as best they can. (Any alleged authority is simply another set of documents.) And literature is what lasts; after buildings crumble, documents remain. Literature is the nonphysical, informational, media heritage.

This literary model provides a set of moral criteria for the rights of the reader (or user). In Literature the author does not imprison: YOU THE READER MAY OPEN ANYTHING AT ANY TIME; YOU THE READER MAY TURN THE

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THINGS TOGETHER; YOU THE READER MAY [sometimes] QUOTE FREELY. These possibilities might well be endangered, I thought, at the hands of those with insufficient sense of human freedom, the human heritage, or the subtle interconnections of ideas and media.

How would these freedoms of literature best be passed on, and extended, to the new literature, the interconnected media objects of tomorrow?*bib5*FOI*

There were many other questions.

T H E Q U E S T I O N S

On the grand scale there were huge issues, political and philosophical, centering around freedom and re-use.

I was at once deeply concerned with freedom of expression, speech, publication, controversy and re-use. I sought these freedoms not just for myself but for everyone, especially minority views outside (and usually suppressed by) the conventional. So how support self-publication? What about Preservation-- how would media objects (especially those expressing minority views) be preserved (and authenticated) when they were digital and swappable?

And how prevent the potential government information evils shown so presciently in Orwell's NINETEEN EIGHTY-FOUR and Bradbury's FAHRENHEIT 451? Would it be as they foresaw, that the natural information behavior of governments is censorship, suppression, disinformation? How much worse this might be in the digital future.

And perhaps most important, could we somehow contrive the deep-dirt survival of the human heritage (--and not just the records that governments want us to keep, either)? For libraries and museums are all too vulnerable, whether to small wars, terrorism or budget collapse.

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But structural concerns confronted me directly. What would be the structural units? And what types of connections would make the most sense? It was obviously vital to avoid special-case links, and seek the greatest generality possible, but what would that generality be, and in what direction would it lie?

On the personal scale, how would I design my own project engine? Tracking of writings and their re-use was important for anyone writing and re-using materials on even a medium scale, tracking excerpts, uses in letters and publications, and contemplated future uses. (One wanted to try variants and alternatives, designs and drafts, yet see always the original context, with easy comparison of their relationships.) How keep track of simultaneous different uses of the same material, and intercomparing those uses? What to do about item control and management, versioning and version management, cross-indexing? And what about deeper possibilities for organizational assistance-- especially ALTERNATIVE ORGANIZATIONS OF THE SAME MATERIALS, and viewing the alternatives?

On the megascale, the questions were oddly similar. HOW WOULD THE NEW LITERATURE BE DEFINED?

How would people be able to connect their media objects to those already published? For being able to tie everything together, according to different points of view, was a principal problem of this integrated media universe. As I saw it, everything ought to be annotatable, interweavable and reworkable by anyone (a proposed world others do not yet understand). Thus the question was, How lay out ground rules for INTERCONNECTABLE MEDIA OBJECTS, allowing commentary and other interconnection?

On the one hand, what about intellectual property: How would ownership-- that is, copyright-- be managed? On the other hand, what about QUOTATION AND COPYRIGHT in electronic publishing? How could materials all be re-used in the ways people needed to re-use them? This re-use issue was special. But then how in the integrated media universe that was to come would we avoid the godawful permissions problem-- which was literally part of the meaning of "copyright"?

But in all cases, from personal documents to large-scale publishing, the principal

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But structural concerns confronted me directly. What would be the structural units? And what types of connections would make the most sense? It was obviously vital to avoid special-case links, and seek the greatest generality possible, but what would that generality be, and in what direction would it lie?

On the personal scale, how would I design my own project engine? Tracking of writings and their re-use was important for anyone writing and re-using materials on even a medium scale, tracking excerpts, uses in letters and publications, and contemplated future uses. (One wanted to try variants and alternatives; designs and drafts, yet see always the original context, with easy comparison of their relationships.) How keep track of simultaneous different uses of the same material, and intercomparing those uses? What to do about item control and management, versioning and version management, cross-indexing? And what about deeper possibilities for organizational assistance-- especially ALTERNATIVE ORGANIZATIONS OF THE SAME MATERIALS, and viewing the alternatives?

On the megascale, the questions were oddly similar. HOW WOULD THE NEW LITERATURE BE DEFINED?

How would people be able to connect their media objects to those already published? For being able to tie everything together, according to different points of view, was a principal problem of this integrated media universe. As I saw it, everything ought to be annotatable, interweavable and reworkable by anyone (a proposed world others do not yet understand). Thus the question was, How lay out ground rules for INTERCONNECTABLE MEDIA OBJECTS, allowing commentary and other interconnection?

On the one hand, what about intellectual property: How would ownership-- that is, copyright-- be managed? On the other hand, what about QUOTATION AND COPYRIGHT in electronic publishing? How could materials all be re-used in the ways people needed to re-use them? This re-use issue was special. But then how in the integrated media universe that was to come would we avoid the godawful permissions problem-- which was literally part of the meaning of "copyright"?

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p.9 | p.10

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This central idea was what I now call TRANSCLUSION, which provided a sweeping solution. Simply stated, this idea meant RE-USE AND INTERCOMPARISON OF RE-USE: SIDE-BY-SIDE COMPARISON of PIECES WHICH RETAINED THEIR ORIGINAL IDENTITY, so that original context would always be recognizable.

Transclusion did not mean conventional copy or transfer of bytes, whereby they lose their identity; it meant IDENTIFIED RE-USE FOR INTERCOMPARISON, keeping all the re-used pieces separate and identified as to their origins, so that each item would have a pathway back to its original. These pathways provide bridges of context-- between the new and original context-- for viewing and other purposes. All instances of the same material would be linked sideways, as it were, so they could be viewed together sideways, as it were, showing all the uses of any item. And a reader would essentially purchase an item, or a portion, thus retaining both that piece and the pathway to its original context, for possible later use.

There are many ways of viewing transclusion; here are two.

pic: H-Viewing & transpointing windows

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My current definition of transclusion: EMBEDDED INSTANCE with ORIGINAL IDENTITY MAINTAINED and ORIGINAL CONTEXT AVAILABLE AND VIEWABLE. An embedded instance, virtually a part of its new context, would still retain its identity, and its path back to the original, and could in principle be supplied from the same portion on disk.

This provided: a method by which you the author could track different uses of your own material; a method for optimizing re-use (e.g. partitioning material into different chapters); a method for viewing versions side-by-side, seeing for each portion the original context; (thus helping to understand material through its different context, and conversely understanding different contexts through their shared material); a method for quotation showing both the new context and the original context; a method for sale of quoted material providing precise proportional royalty to the orignal publisher, providing a pathway back to the original, and providing credit to the originator; a method for publishers to track re-uses of their published materials.

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While the project was designed from the beginning as a single-user system, an engine for the managing of personal rework and intercomparison, that did not mean it was a small-scale system, since it would have to deal with the maintenance of massively parallel intellectual and creative projects which shared material.

It would be HYPERARCHICAL, that is, permitting the same material to be organized at the same time with simultaneous alternative sequences, hierarchies, structures. These would not be treated as contradictory but rather as

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It could also be a system for workgroups, sharing material and carrying it forward into new interweavable and intercomparable constructions under individual and joint authorship.

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The first methods I came up with are now called "logging system" (a system that changes continually by new additions), "monotonic storage" (a storage system that acquires without deletion or overwrite), and "delta list" (log of changes that can be re-played and reversed for historical stepping, backtrack and revision; however, mine had a modifiable treelike structure).*bib8*rev.tree* Note that two of my early design features for personal text handling, non-losable item control and thread management, had the distinction of being thrown out of the first visual word processor project.*bib7*Htextfor360*

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2) Beneath that, a networkable server to manage changing, re-usable hypertext and hypermedia contents and structure, including: (a) Edit changes among versions, (b) Links visible from the citing and cited end (bivisible), (c) Quoting re-uses (transclusions).

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4) An extension to the doctrine of copyright, intended to free all materials for such unrestricted on-line quotation and republishing.

5) A vehicle for new, highly generalized literary forms:

(a) COLLATERAL HYPERMEDIA, meaning materials intended for side-by-side presentation showing links and transclusions (as in the interior-linked counterpart windows, shown earlier).

(b) Possibly the most general hypermedia form, THE HYPERPLEX: a complex of information wherein everything is stored in its "full correct" structure, with all relationships represented by links and transclusions (or in case of doubt, ALTERNATIVE VERSIONS of its correct structure).

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First of all this would be a personal revision server and project tracker for myself (and other writers and scholars-- but there was no point asking what they wanted in those days). It would manage and track re-use with instance comparison in all projects and publications, from sequential text on up; indeed, it would allow HYPERARCHICAL structure, with the same material organized at the same time with simultaneous alternative sequences, hierarchies, structures; especially parallel overlapping hypermedia projects and alternative organizations for them.

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And it would facilitate self-publishing of every kind.

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Further, the global publishing system need be in its structure no different from the one-person system-- MANAGING RE-USE WITH INSTANCE COMPARISON-- except that it had to be distributed, and manage the distributed detached proportional royalty system I had come up with.

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CAPSULE XANADU HISTORY

I undertook this project alone with little hope of explaining it to others; but as it persevered into the 1970s and beyond, a few brilliant people have understood and worked hard for the idea.*FTNT*

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Under continuous development since the fall of 1960, the technical side of the Xanadu project has been a series of server designs to support transclusive re-use, intercomparison, and of course other hypermedia functions, both for personal use and as a publishing network. The history through 1988 is in a book.*bib7*LM* After 28 years on shoestrings, substantial funding was provided by Autodesk, Inc., from 1988 to 1992 and then dropped.

Concretely, about half a dozen server designs have been implemented to various degrees, some completed but (for political reasons) never tested or marketed. A group assembled in 1979 designed an extraordinary server for both the one-person and the distributed publishing system. This server was completed in 1988. A redesign*bib8*XOC.DOC* continued until funding ended. These last two servers ("88.1" and "The XOC Server") were remarkably designed fine-grained connection-tracking mechanisms for rework and comparison, scalable to large networks. These were essentially readdressing boxes, translating from arbitrary version addresses to original storage addresses and vice versa.

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7. Transvisibility, or the ability to reach different transcluded instance portions from the original or from one another.

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As a design issue, transvisibility represents one of the greatest differences among transclusive servers. The easy case is transvisibility between an instance and its original; the hardest case is transvisibility among all instances, transcluded to separate documents. Different server designs provide different degrees of transvisibility. All transcluded copies on any servers can of course reach the original.

This visibility was possible in varying degrees in the different Xanadu designs; the last two server designs implemented total all-version transvisibility to the byte level, no mean feat.

This has important consequences for what kind of a media world can be built. DEEP transmedia, showing arbitrary shared transclusions between works, essentially require strong transvisibility.

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The basic grand objective of the Xanadu system was always to provide an enabling technical platform, commercial and legal system for an interpenetrating literature of freely-weaving transmedia. But could this be accomplished piecemeal?

New models appeared that surprised me. It turned out that a number of layers could be distinguished clearly. Several levels of implementation were distinct: the single-user project tracker engine with edit changes, the publication server, and the publication server network, could all be different devices or programs. (Indeed, they could all use or more than one technology at the same time.) The publication model and the legal system were at still further removes of abstraction.

There were some megaproblems of the large-scale publishing docuverse (for which technical solutions had been designed into our later servers), notably:

1. Sacrificing detailed edit tracking meant loss of transvisibility among versions, since the edit changes coupled the transclusions of the same bytes among separate versions. The coupling of those transclusions kept links to old bytes punching through to new versions. This was a regrettable loss, but had only been part of the late model servers. Relinquishing that part makes server design all much simpler, still preserving the key aspects of the original publishing model.

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The basic grand objective of the Xanadu system was always to provide an enabling technical platform, commercial and legal system for an interpenetrating literature of freely-weaving transmedia. But could this be accomplished piecemeal?

New models appeared that surprised me. It turned out that a number of layers could be distinguished clearly. Several levels of implementation were distinct: the single-user project tracker engine with edit changes, the publication server, and the publication server network, could all be different devices or programs...(Indeed, they could all use or more than one technology at the same time.) The publication model and the legal system were at still further removes of abstraction.

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TRANSPUBLICATION: A SYSTEM OF PERMISSIONS

The publishing doctrine of sharable re-use, previously tied to technicalities, turned out to be totally independent of any particular implementation.

Xanadu publishing was always intended to be an ever-quotable publishing system of interpenetrating distributed literature, freeing all materials for on-line republishing, without special arrangement, in quotations, anthologies and collages, while always paying royalty to the original publisher (and interfering with no other systems of copyright, on-line or off). Turning out to be quite separate from any implementation, this had always really been a legal and business model, with a specific permission system on the bytes.

I am now promulgating this separately from Xanadu, free for all, as the "transcopyright" permission arrangement.*bib10*transpub* (It requires SOME implementation, to be sure, but none on the levels of intricacy the Xanadu project has attempted.) This copyright permission system, always implicitly a part of the design, requires that all material be re-usable out of context without oversight by the copyright holder. Thus a copyright owner relinquishes context control of all materials and receives appropriate royalty on all instances sold.

Any republisher has permission to embed material in whatever new contexts. However, the republisher may only transmit stripped-down versions, with pointers representing the quoted materials to be embedded in these new contexts. Each recipient purchases the quotations (text, video, music, etc.) anew from the original publisher, and retains the quotations' original addresses, thus maintaining the accessibility of each original context and intellectual credit to each original author.

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WITH ONE SMALL CHANGE (paragraph 6, sentence 1.)

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>From bieber@cis-gw.njit.edu Thu May 4 22:00:31 1995
>Date: Thu, 4 May 1995 08:52:48 -0400
>From: Michael Bieber <bieber@cis-gw.njit.edu>
>To: ted@hyper.sec.or.jp
>Subject: Final Version.txt
>Content-Length: 6822
>X-Lines: 159
>Status: RO

THE HEART OF CONNECTION:

Hypermedia Unified by Transclusion

Theodor Holm Nelson

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Let me begin again, for few have understood.

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What would be the best underlying abstractions for this ultimate union and generalization of literature and movies? Personally I wanted a system for massively parallel creative work and study; more grandly, I sought to design the rightful literature and art canvas of the future, creating a technical, legal and commercial basis for a world-wide populist and participatory electronic literature of freely-weaving screen transmedia-- republishable and quotable without restriction-- to the betterment of human understanding and freedom of expression and access [1]. What better dream at twenty-three? And still a good idea.

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The central idea has always been what I now call *transclusion*, or re-use of material with original context available, through embedded shared instancing (rather than duplicate bytes). Thus the user may intercompare contexts of what is re-used, both for personal work (keeping track of re-use) and publication (for deep comprehension and study).** Transclusion brings to electronic publishing a copyright method that makes republication fair and clean: Each user buys each quotation from its own publisher, assuring proper payment (and encouraging exploration of the original).

Contexts of transclusions must be visually comparable on screen (figure 1). (Unfortunately, today's windowing systems do not yet allow arrows and bands to cross frame boundaries.)

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Since then, colleagues and I have implemented (in varying degrees) half a dozen server designs, improving granularity (especially editability of embedded instances), mechanisms of transclusion, mechanisms of versioning, and transvisibility (the ability to reach different instance portions from one another) [3]. Substantial funding was provided for a time by Autodesk, Inc. [4]

Of late I have rethought the system's core, which had always seemed irreducible. I now discern layers: project tracker, engine, change manager, networking this and that, publication server, sale method, legal basis, etc. Separable specifications will help everyone to build systems of this class on a mix-or-match basis. I already have elucidated the copyright method-- actually an open permission system-- in a separate paper [5].

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Sausalito CA 94965

email ted@xanadu.net

xacm.b3may.e2.snt → e3

Michael Bieber's draft, received 95.5.3;
with my suggested revision-- five changes, as faxed to Bieber
at 4 am on May 3/4, 1995.

The changes are noted.

==========

From bieber@cis-gw.njit.edu Wed May 3 23:57:39 1995
From: bieber@cis-gw.njit.edu (Michael Bieber)
Date: Wed, 3 May 1995 10:50:12 EDT
X-Mailer: Mail User's Shell (7.1.2 7/11/90)
To: ted@hyper.sec.or.jp
Subject: resending...
Content-Length: 7452

--- Forwarded mail from bieber@cis.njit.edu (Michael Bieber)

>From bieber Wed May 3 07:39:23 1995
X-Mailer: Mail User's Shell (7.1.2 7/11/90)
To: ted@hyper.sec.or.jp
Subject: CACM: Final Version
Cc: bieber@cis.njit.edu

Hi Ted,

That phone call last week was very useful. I think we're on the final version. Actually we have to be because the CACM is doing major arm twisting. OK OK, I know the delay is on my end. Sorry.

The major change is that I've added the following captions for your three figures:

Figure 1a & 1b: Deep Intercomparison Viewing-- Transclusion through Zipper Lists: Zipper lists are a data structure and viewing method for multithreaded items. Figure 1a shows item A's logical existence in three contexts. The user would view this as Figure 1b's equivalent zipper lists, with bands indicating item A's transclusion (virtual presence) in the three contexts side-by-side.

*****Change last two lines to:
zipper lists, with equality-bands indicating item A's transclusion (virtual presence) in the three contexts side-by-side.

Figure 1c: Deep Intercomparison Viewing-- Transclusion and Link Display through Transpointing Frames: Bands indicate the transclusion of text across window frames in two contexts. Arrows show links across window frames.

If you're happy with this, we can send it on to the CACM. Maybe you could fax me a final copy---today if possible.

Thanks,

Michael

++++++++++++++++++++++++++

THE HEART OF CONNECTION:
Hypermedia Unified by Transclusion

Theodor Holm Nelson

I can imagine few honors greater than a facing page to Douglas Engelbart's; he is one of the great men of our century and I love him dearly. Like Doug I have had a unified vision, of which today's popular attainments are only centerless shadows of the edge.

But I have till now had little basis for conversation with the computer

mainstream. Coining words has hardly helped (e.g., hypertext, hypermedia, transclusion).

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dearly. Like Doug I have had a unified vision, of which today's popular attainments are only centerless shadows of the edge. But I have till now had little basis for conversation with the computer mainstream. Coining words has hardly helped (e.g., hypertext, hypermedia, transclusion).

Let me begin again, for few have understood.

After college, wishing to work alone as rogue philosopher and film-maker, I was troubled about distribution for self-publishing and how to manage notes and threads for many projects. Then I took a computer course. Philosophically, I saw that the computer was a clockwork of arbitrary abstractions designable any which way; cinematically, I saw it would become the theater of all media turned interactive. These two angles fused into a stereo perspective pointing far beyond.

What would be the best underlying abstractions for this ultimate union and generalization of literature and movies? Personally I wanted a system for massively parallel creative work and study; more grandly, I sought to design the rightful literature and art canvas of the future, creating a technical, legal and commercial basis for a world-wide populist and participatory electronic literature of freely-weaving screen transmedia-- republishable and quotable without restriction-- to the betterment of human understanding and freedom of expression and access [1]. What better dream at twenty-three? And still a good idea.

By 1960's end I had a design paradigm centering around deep intercomparison. The resulting system design (called since 1967 "Xanadu"*) has always been a unified scalable concept, both for personal work environments (managing private versions) and for hypermedia publishing-- that is, all publishing.

The central idea has always been what I now call transclusion, or re-use of material with other contexts available through embedded shared instances (rather than duplicate copies). Thus the user may intercompare contexts of what is re-used, both for personal work (managing re-use) and publication (for deep comprehension and study).** Transclusion brings to electronic publishing a copyright method that makes republication fair and clean: Each user buys each quotation from its own publisher, assuring proper payment (and encouraging exploration of the original).

***** Change line 4 above to:
(keeping track of re-use) and publication (for deep comprehension and study).**

Contexts of transclusions must be visually comparable on screen (figure 1). (Unfortunately, today's windowing systems do not yet allow arrows and bands to cross frame boundaries,)

<figures & captions>

Such intercomparative use at the center of all digital function meant building a new kind of file system. It would be hyperarchical, permitting the same material to be organized into simultaneous alternative structures-- hierarchies, sequences, hyperplexes. It could permit no embedded codes, would make all changes by optional additions and structural overlay. As a deep revision server and project tracker for writers, scholars and programmers, it would manage re-use and instance comparison in all projects and publications. Users trying many possible organizational strategies could maintain all of them to express the unified fullness of their exact ideas. And this single-user console would scale up directly to groupware and a mighty on-line publishing server for tomorrow's transclusive all-media literature.

***** Change last line to:
server for tomorrow's transclusive all-media interactive literature.

Since then, colleagues and I have implemented (in varying degrees) half

a dozen server designs, improving granularity (especially editability of embedded instances), mechanisms of transclusion, mechanisms of versioning, and transvisibility (the ability to reach different instance portions from one another) [3]. Substantial funding was provided for a time by Autodesk, Inc. [4]

Of late I have rethought the system's core, which had always seemed irreducible. I now discern layers: project tracker engine, change manager, networking this and that, publication server, sale method, legal basis, etc. Separable specifications will help everyone to build systems of this class on a mix-or-match basis. I already have elucidated the copyright method-- actually an open permission system-- in a separate paper [5].

Like Doug Engelbart, I slog on with ideals held high above the mud. Ironically, Doug and I started from completely opposite premises: he to empower work groups and make them smarter, I to free the individual from group obtuseness and impediment. That we have converged on common ideas to any degree is astonishing, and shows, I think, their correctness and generality.

* "Xanadu," a name adopted about 1967, is a registered trademark of Project Xanadu.

** For sequences of discrete chunks, transclusion is isomorphic to multithreading items [2]. (Fig. 1 of [2]).

BIBLIOGRAPHY

1. Nelson, T., "Xanadu: Document Interconnection Enabling Re-Use with Automatic Author Credit and Royalty Accounting," Information Services & Use 14, 1994.

2. Nelson, T., "A File Structure for the Complex, the Changing and the Indeterminate." Proceedings of the ACM Twentieth National Conference, 1965.

3. Nelson, T., Literary Machines, various editions; most recent is a Japanese translation, 1994, ASCII Press. Most recent English version: Literary Machines 93.1, Mindful Press, Sausalito CA.

***** Change last line to:
Literary Machines 93.1, Mindful Press, 3020 Bridgeway #295, Sausalito CA 94965.

4. XOC, Inc., "Xanadu Hypermedia Server, Developer Documentation," Mindful Press, 1992.

5. Nelson, T. "Transcopyright: Pre-Permission for Virtual Republishing," 1995, unpublished.

BIOGRAPHY

Best known for coining the words "hypertext" and "hypermedia" in the early sixties, Ted Nelson considers his to be the third school of computer thought (after hierarchicalism and AI but preceding Xerox PARC by years). Nelson's theory of Virtuality subsumes software under cinema as the design of seeming.

CONTACT INFORMATION

Theodor Holm Nelson
Project Xanadu
3020 Bridgeway #295
Sausalito CA 94965

email ted@xanadu.net

[error noted but not of consequence]

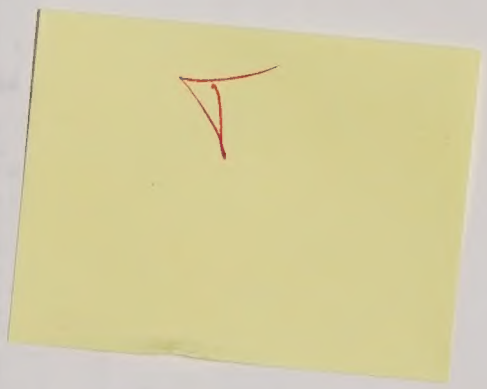
Hi David-- it's maybe noon your time Wednesday 3 May--

Here's what I hope are final pictures, to make sure we're clear. I changed some details of "All Gaul," since I didn't have access to the Gibbon book.

I'll call you short ly.

Theo.d'Or

Encl: xacm.pix.d19 (2 pp.)



Theodor Holm Nelson *Founder of Interactive Media* *Founder of Network Publishing*

Project Xanadu® On-Line Storage and Publishing Agency

3020 Bridgeway #295, Sausalito CA 94965 415/ 331-4422 Fax 415/ 332-0136

e-mail ted@xanadu.net

and

Sapporo HyperLab Doshin Maruyama, 8F • 2-20, Odori Nishi 20-chome

Chuo-Ku, Sapporo-shi, Hokkaido 064 JAPAN

[Some weird stuff can appear]

Hi David-- it's maybe noon your time Wednesday 3 May--

Here's what I hope are final pictures, to make sure we're clear. I changed some details of "All Gaul," since I didn't have access to the Gibbon book.

I'll call you short ly.

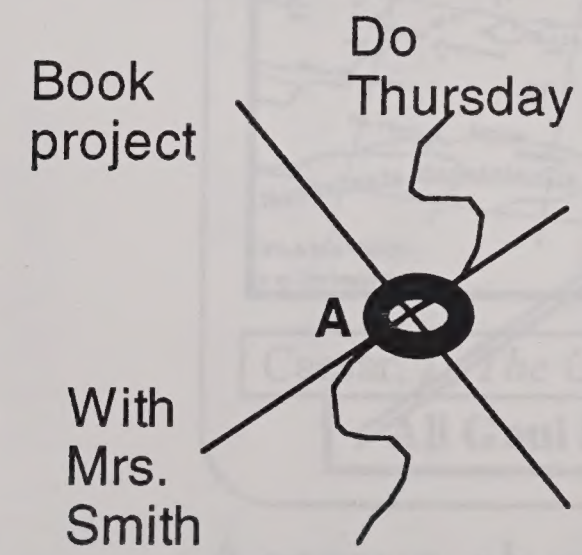
Encl: xacmplc.d19 (2 pp.)

page 1 xacm.pix
page 1 xacm.pix
page 1 xacm.pix
page 1 xacm.pix

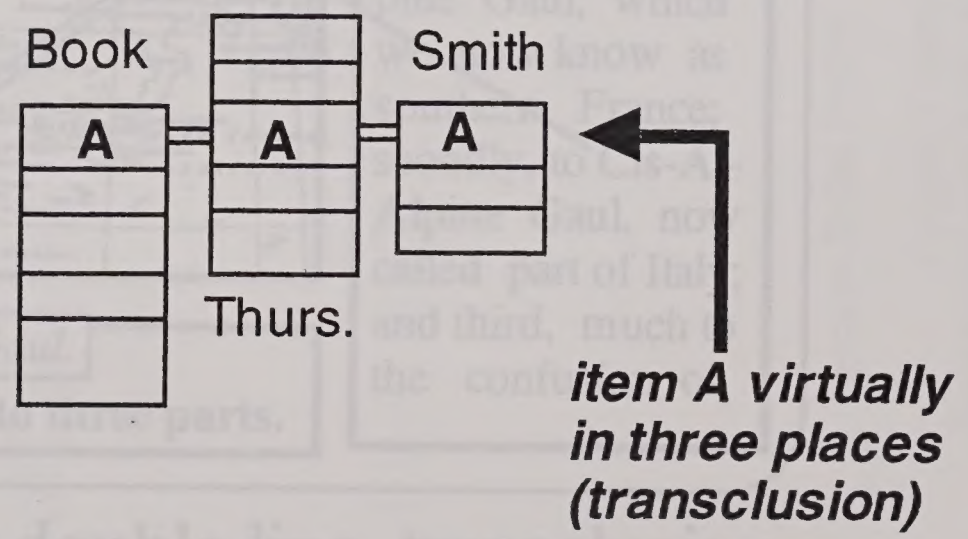
Zipper Lists

a data structure and viewing method for multithreading of items (Nelson, 1965).
Double line indicates equality (by transclusion).

Multithreading of Item A



Zipper Lists Equivalent to Multithreading



Multithreading to Multiplex Latency

Multithreading to Multiplex Latency

Zipper Lists

Double linked structure (by Clampsky (version) 1965).

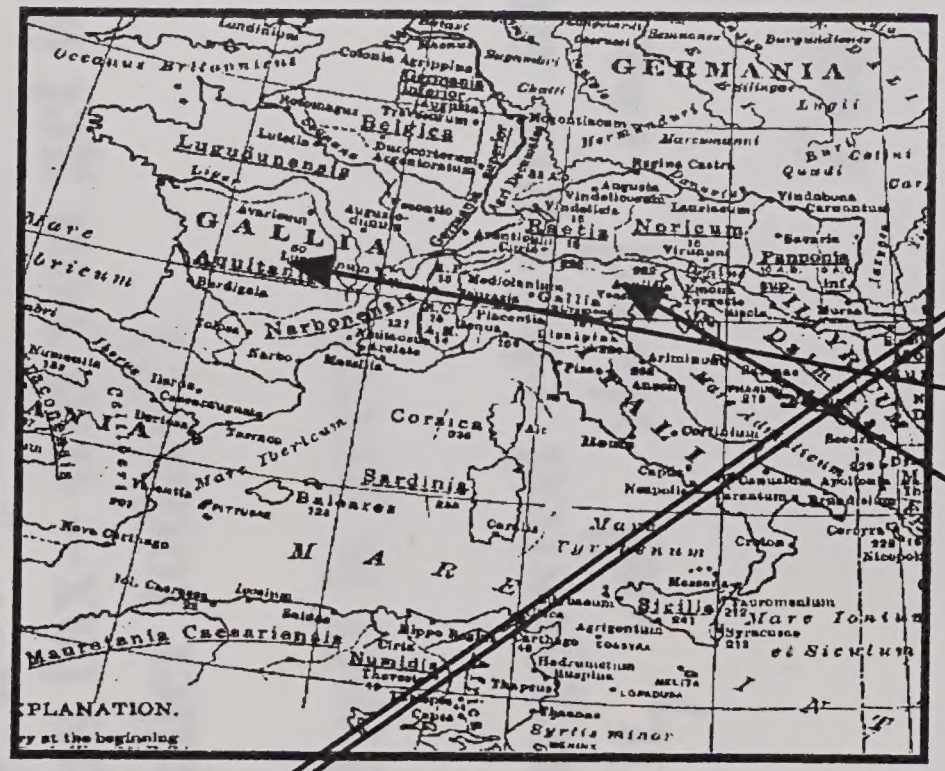
Multidimensional to simultaneously (Nelson, 1965).

for Doubly and viewing Spanning method for

a deb structure rep a

Transpointing Frames

allow the user to see deep relationships.



Caesar, J. *The Conquest of Gaul.*

All Gaul is divided into three parts.

Snerd, I., *Rome As I See It.*

When Caesar said, "All Gaul is divided into three parts," he referred, first, to Trans-Alpine Gaul, which we now know as southern France; seondly, to Cis-Al-Alpine Gaul, now called part of Italy; and third, much to the confusion of

Arrows show links; double line, transclusion.

Transporting Trams

allow the tram to see deep relationships.

Arrows show 'pull', double line 'pushed' motion.

Hi Michael--

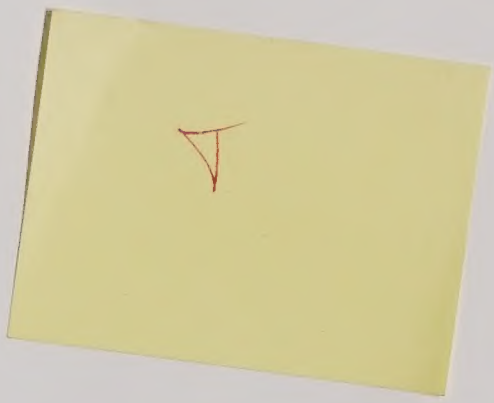
(Oops, got your name wrong on the previous fax-- did you get it? With revised pix, earlier today?)

Your draft is great.

Five suggested changes and I'm signing off on it, well, almost, one more quick read—

Ted

Encl: xacm.b3may.handrev (3 pp.)



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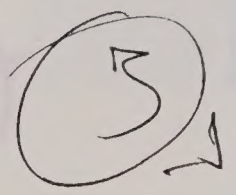

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Republishing," 1995, unpublished.

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email ted@xanadu.net

--- End of forwarded message from bieber@cis.njit.edu (Michael Bieber)

Hi Michael--

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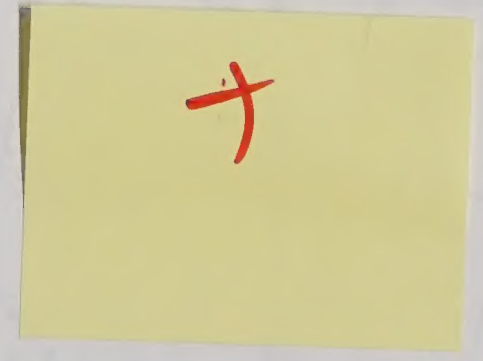
Best, Ted

Encl: blown-up map of Gaul, from 1913 Merriam-Webster's
(copyright expired)



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Tel. (from the States) 011 81 11 621-1133 Fax (from the States) 011 81 11 621-1170
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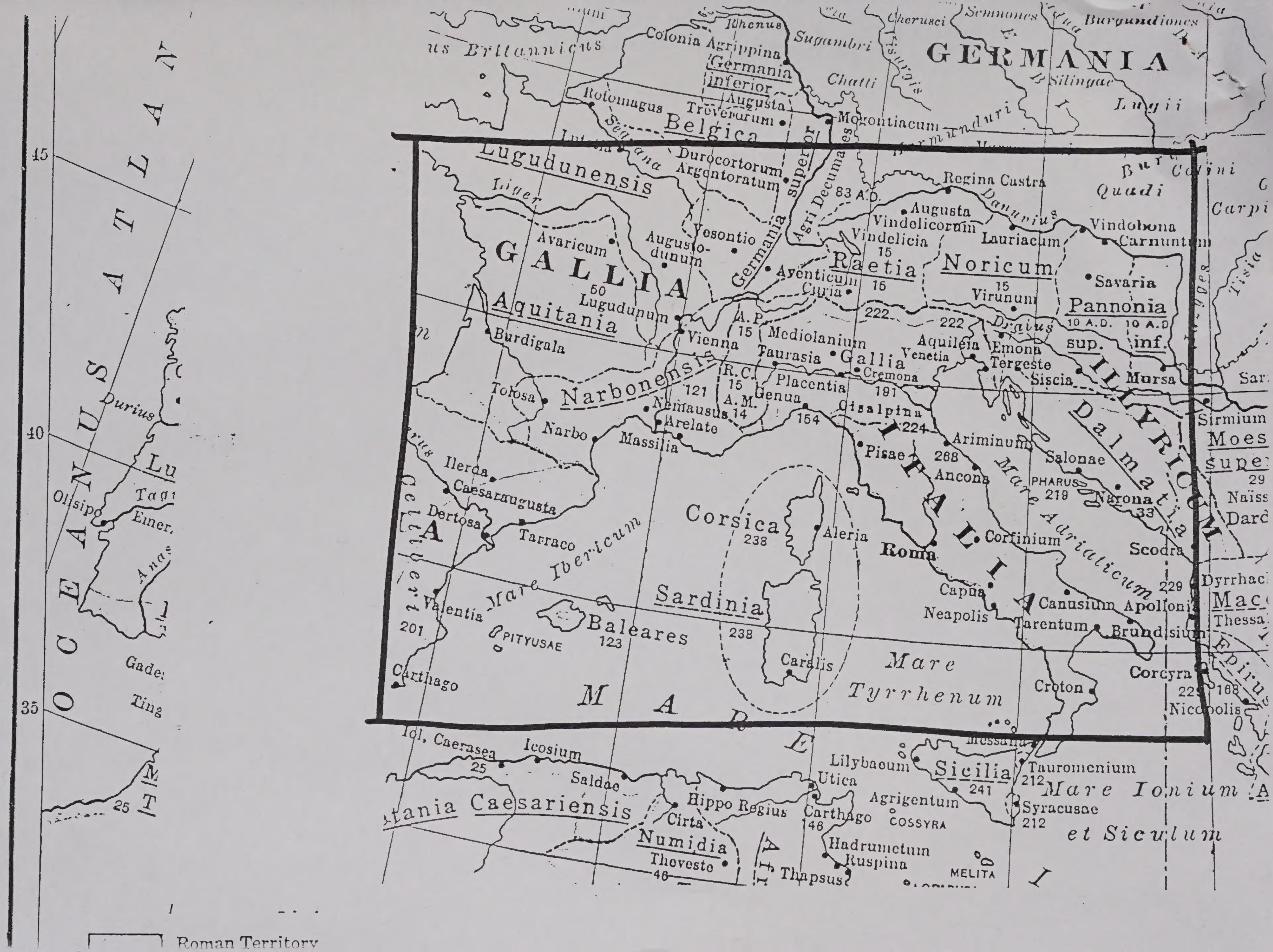
GERMANIA
Germania inferior
Germania superior
Colonia Agrippina
Rhenus
Sugambri
Chatti
Cherusci
Semnones
Burgundiones
Silingae
Lugii
Mogontiacum
Hermunduri
Quadi
Carpi
Tisia
Agri Decumates
83 A.D.
Regina Castra
Danuvius
Augusta Vindelicorum
Vindelicia
Raetia
15
16
Noricum
Lauriacum
Virunum
Vindobona
Carnuntum
Savaria
Pannonia
10 A.D.
sup.
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Mursa
Sirmium
Moesia superior
29
Naïssus
Dardania
ILLYRICUM
Dalmatia
Salonae
PHARUS
219
Narona
33
Scodra
Dyrrhachium
Apollonia
229
Macedonia
Thessalia
Epirus
Corcyra
168
Nicopolis
Britannicus
Rotomagus
Augusta Treverorum
Belgica
Sequana
Lutetia
Durocortorum
Argentoratum
Vesontio
Lugudunensis
Liger
Avaricum
Augustodunum
GALLIA
50
Lugudunum
Aquitania
Burdigala
Tolosa
Narbonensis
121
Narbo
Nemausus
Arelate
Massilia
Vienna
Aventicum
Curia
A.P.
15
R.C.
A.M.
14
Mediolanium
Taurasia
Gallia Cisalpina
Cremona
Placentia
Genua
154
191
222
224
Aquileia
Venetia
Emona
Tergeste
Siscia
Dravus
ITALIA
Pisae
Ariminum
288
Ancona
Roma
Corfinium
Capua
Neapolis
Canusium
Tarentum
Brundisium
Croton
Mare Adriaticum
Mare Tyrrhenum
Corsica
238
Aleria
Sardinia
Caralis
Baleares
123
PITYUSAE
Mare Ibericum
Ilerda
Caesaraugusta
Dertosa
Tarraco
Celtiberi
Valentia
201
Carthago
Durius
Lusitania
Tagus
Olisipo
Emerita
Anas
Gades
Tingis
OCEANUS ATLANTICUS
45
40
35
25
MARE
Iol, Caesarea
Icosium
Saldae
Mauretania Caesariensis
Hippo Regius
Cirta
Numidia
Thovesto
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Africa
Utica
Carthago
146
Hadrumetum
Ruspina
Thapsus
Lilybaeum
Sicilia
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Messana
Tauromenium
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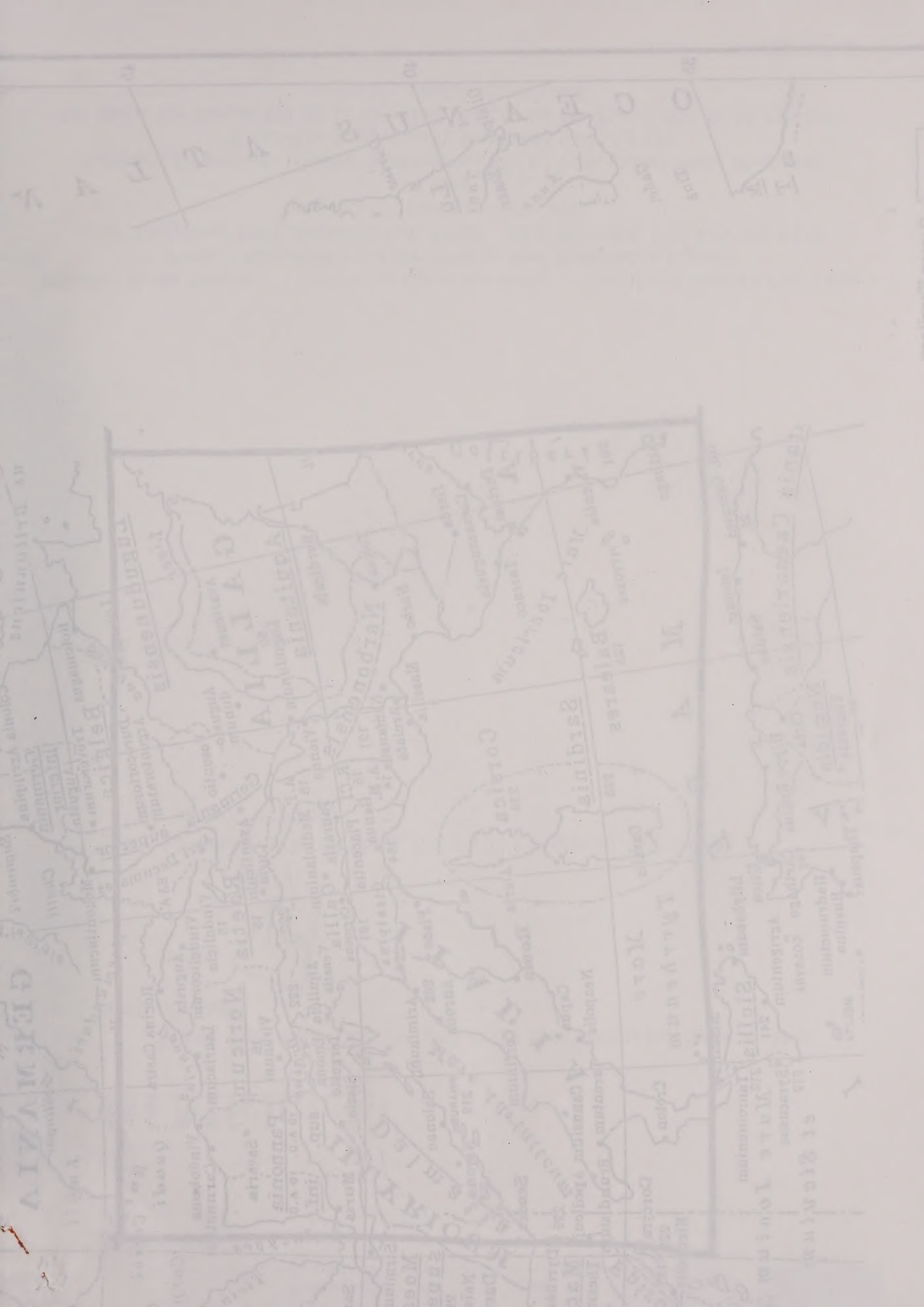
Agrigentum
Syracusae
COSSYRA
MELITA
Mare Ionium et Siculum
Roman Territory



FOR XACM

From bieber@cis-gw.njit.edu Tue Feb 14 20:53:35 1995
From: bieber@cis-gw.njit.edu (Michael Bieber)
Date: Tue, 14 Feb 1995 06:33:20 EST
X-Mailer: Mail User's Shell (7.1.2 7/11/90)
To: ted@hyper.sec.or.jp
Subject: CACM Notes
Content-Length: 1469

Hi Ted,

Thanks for keeping me up to date on your correspondance with Diane Crawford. A couple of notes on my end.

- Please send your one-pager to me. Email is preferable.

- I'd like to consider this as a first draft, if I may, and allow the authors in the special issue to make referee-style comments. It's up to you whether you want to make any changes based on their comments.

- No pictures in the CACM.

- Could you send a short one-paragraph bio? Thanks.

Cheers,

Michael

****
**** CACM Special Issue Co-Editors ****
**** Designing Hypermedia Applications ****
****

* Michael Bieber	Tomas Isakowitz *
* New Jersey Institute of Technology	New York University *
* CIS Department	Information Systems Department *
* University Heights	44 West 4th Street *
* Newark, NJ 07102-1982 USA	New York, NY 10012-1126 USA *
* bieber@cis.njit.edu	tomas@stern.nyu.edu *
* tel: (201) 596-2681	(212) 998-0833 *
* fax: (201) 596-5777	(212) 995-4228 *

****

From bieber@cis-gw.njit.edu Fri Apr 21 22:28:32 1995
From: bieber@cis-gw.njit.edu (Michael Bieber)
Date: Fri, 21 Apr 1995 09:00:54 EDT
X-Mailer: Mail User's Shell (7.1.2 7/11/90)
To: ted@hyper.sec.or.jp
Subject: CACM Figures
Cc: bieber@cis.njit.edu
Content-Length: 936

Hi Ted,

I got your figures fax on Wednesday (I only go in two days a week). Thanks. I'm afraid that the figures still are unclear to me. So I hope you don't mind yet another round.

- One thing that may help is a 1-2 full-sentence caption for each.

- You don't discuss "h-viewing" or "zipper lists" in your sidebar. You need to explain them in your caption or remove these terms.

- In the H-Viewing figure, it's not clear to me what the thin lines between the two "columns" are, or what the lines creating separate sections within each column mean. This may be because you're using "rhubarb" text instead of real words, so I can't see the correspondences among the linked sections.

Also, could you attach both a short bio and any contact information you'd like to reveal to the public, to your sidebar text? (I'm still awaiting the final version of it, given my previous comments on Version d20.)

Thanks,

Michael

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Fax to: Michael Bieber
Fax 201/596-5777

Afternoon Michael--

Herewith closing draft 18.

800 words, just like yours.

Pix fix follow. Finally thought of the good example.

Our damn Unix server is full, can't use email. Should be fixed within eight hours.

Thanks

T

Encl: xacm.clz.d18

Theodor Holm Nelson
Founder of Interactive Media *Founder of Network Publishing*
Project Xanadu®
3020 Bridgeway #295, Sausalito CA 94965
Tel. 415/ 331-4422 Fax 415/ 332-0136
e-mail ted@xanadu.net
and
Sapporo HyperLab Doshin Maruyama, 8F • 2-20, Odori Nishi 20-chome
Chuo-Ku, Sapporo-shi, Hokkaido 064 JAPAN
Tel. (from the States) 011 81 11 621-1133
Fax (from the States) 011 81 11 621-1170

d18

800 words (text+ftnts+bib, not title)

(major outs)

page 1

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THE HEART OF CONNECTION: Hypermedia Unified by Transclusion

Theodor Holm Nelson

I can imagine few honors greater than a facing page to Douglas Engelbart's; he is one of the great men of our century and I love him dearly. Like Doug I have had a unified vision of which today's popular attainments are only centerless shadows of the edge.

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The resulting system design (called since 1967 "Xanadu"*) has always been a singular unified scalable concept, both for personal work environments (managing private versions) and for hypermedia publishing-- that is, all publishing.

The central idea has always been what I now call *transclusion*, or re-use of material as instances embedded in new contexts. Re-used portions of material are kept identifiable and virtually connected. Thus the user may *intercompare contexts* of what is re-used.** Transclusion brings to electronic publishing a copyright method that makes re-use fair and clean: Each user buys each quotation from its own publisher, assuring proper payment and encouraging exploration of the original.

Contexts of transclusions must be visually comparable on screen (figure 1). (Unfortunately, today's windowing systems do not yet allow arrows and bands to cross frame boundaries,)

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(major outs)
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Fig. 1: Deep Intercomparison Viewing

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It would be *hyperarchical*, permitting the same material to be organized at the same time into simultaneous alternative structures-- hierarchies, sequences, hyperplexes. It could permit no embedded codes, would make all changes by optional additions and handle all structure by optional overlay. As a deep revision server and project tracker for writers, scholars and programmers, it would manage re-use and instance comparison in all projects and publications. Users trying many possible organizational strategies *needed to cut no connections*, expressing the unified fullness of their exact ideas. And this single-user console would scale up directly to groupware and the mighty publishing system.

Since then, colleagues and I have implemented (in varying degrees) half a dozen server designs to various degrees, improving granularity (especially editability of embedded instances), mechanisms of transclusion, mechanisms of versioning, and transvisibility (the ability to reach different instance portions from one another).(3) Substantial funding was provided for a time by Autodesk, Inc.(4)

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[end: xacm.cl2.d16]

Fax to: Michael Bieber
Fax 201/596-5777

Good to hear yr. voice.

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I'll get it down this weekend to size you sent.

Thanks

T Ted

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xacm.cfz.e20.txt

Date of this draft: 95.4.12

[PICTURES NOT INCLUDED]

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799 words (text+ftnts+bib, not title)

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Fax to: Michael Bieber
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I'll get it down this weekend to size you sent.

Thanks

T Ted

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e-mail ted@xanadu.net

beebio.e3

95.4.26

Bio-blurb:

Best known for coining the words "hypertext" and "hypermedia" in the early sixties, Ted Nelson considers his to be the third school of computer thought (after hierarchicalism and AI but preceding Xerox PARC by years). Nelson's theory of Virtuality subsumes software under cinema as the design of seeming. This paper discusses its representational component.

From bieber@cis-gw.njit.edu Fri Apr 21 22:28:32 1995
From: bieber@cis-gw.njit.edu (Michael Bieber)
Date: Fri, 21 Apr 1995 09:00:54 EDT
X-Mailer: Mail User's Shell (7.1.2 7/11/90)
To: ted@hyper.sec.or.jp
Subject: CACM Figures
Cc: bieber@cis.njit.edu
Content-Length: 936

Hi Ted,

I got your figures fax on Wednesday (I only go in two days a week). Thanks. I'm afraid that the figures still are unclear to me. So I hope you don't mind yet another round.

- One thing that may help is a 1-2 full-sentence caption for each.

- You don't discuss "h-viewing" or "zipper lists" in your sidebar. You need to explain them in your caption or remove these terms.

- In the H-Viewing figure, it's not clear to me what the thin lines between the two "columns" are, or what the lines creating separate sections within each column mean. This may be because you're using "rhubarb" text instead of real words, so I can't see the correspondences among the linked sections.

Also, could you attach both a short bio and any contact information you'd like to reveal to the public, to your sidebar text? (I'm still awaiting the final version of it, given my previous comments on Version d20.)

Thanks,

Michael

Apr 28 18:20 1995 standard input Page 1

From bieber@cis-sw.njit.edu Fri Apr 21 22:28:32 1995
From: bieber@cis-sw.njit.edu (Michael Bieber)
Date: Fri, 21 Apr 1995 09:00:54 EDT
X-Mailer: Mail User's Shell (7.1.2 7/11/90)
To: tedd@yper.mec.or.jp
Subject: CACM Figures
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bieberpixlet.el
95.4.26

NOT SENT

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In response to your questions about pictures.

>I got your figures fax on Wednesday (I only go in two days a week).
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>you don't mind yet another round.

0) You didn't ask, so I kind of suppose the Gaul picture was okay, but I'm slightly flabbergasted; so I'm sending airmail the actual map from which it was taken (out of copyright), in case, as you said, somebody redoes it.

Since the Edward Gibbon quote was phony, I'd like to make a change, "if it's not too late." To come later tonight (your "today").

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>- In the H-Viewing figure, it's not clear to me what the thin lines between
>the two "columns" are, or what the lines creating separate sections within
>each column mean. This may be because you're using "rhubarb" text instead
>of real words, so I can't see the correspondences among the linked
>sections.

The two lines indicate EQUALIY AND TRANSCLUSION: meaning that the item in the two lists is the same item. Will endeavor to clarify.

>Also, could you attach both a short bio and any contact information you'd
>like to reveal to the public, to your sidebar text? (I'm still awaiting
>the final version of it, given my previous comments on Version d20.)

Theodor Holm Nelson e-mail ted@xanadu.net
Founder of Interactive Media | Founder of Network Publishing
Project Xanadu(R) On-Line Storage and Publishing

---

xacm.beeb2.e3

95.4.26

AS SENT

HI MICHAEL--

Several changes you made were quite good and right, eg moving the "deep intercomparison" sentence. Thanks.

I here document my concerns.

I will call as soon as this is sent. (It's about your 1 pm Wednesday.

Best wishes,

Ted

>--> Do you want to put in contact information at all (anything up to and
>including email, fax, URL...)
>
>--> Do you have a short bio-blurb up to 50 words we could use?

Later--

==========

THE HEART OF CONNECTION:
Hypermedia Unified by Transclusion

Theodor Holm Nelson

I can imagine few honors greater than a facing page to Douglas Engelbart's; he is one of the great men of our century and I love him dearly. Like Doug I have had a unified vision, of which today's popular attainments are only centerless shadows of the edge.

But I have till now had little basis for conversation with the computer mainstream. Coining words has hardly helped (e.g., hypertext, hypermedia, transclusion).

Let me begin again, for few have understood.

After college, wishing to work alone as rogue philosopher and film-maker, I was troubled about distribution for self-publishing and how to manage notes and threads for many projects. Then I took a computer course. Philosophically, I saw that the computer was a clockwork of arbitrary abstractions designable any which way; cinematically, I saw it would become the theater in which all media turned interactive.

I STRONGLY PREFER:
I saw it would become the theater of all media turned interactive.

WHY: Stronger phrasing. Also, they do not "turn interactive" by themselves, but are turned. By someone.

(continuing the paragaraph):
These two angles fused into "stereo" with far-reaching consequences.

I STRONGLY PREFER:
These two angles fuse into stereo that points far beyond.

WHY:
1. Quotes are weaselly and I never use them. Either I mean a word or I don't use it.
2. IT'S THE TRUTH. My two points of view gave me a perspective nobody else had, or has yet. The stereo metaphor is quite deep (pun):

the separate angles make the truth stand out in a new way, and it has implications FARTHER AWAY, down the line, in the direction pointed to by the stereoscopic view.
However, by putting it in the present tense I've softened it a little, makes it maybe a little less egotistical.

What would be the best underlying abstractions for this ultimate union and generalization of literature and movies? Personally, I wanted a system for massively parallel creative work and study;

I STRONGLY PREFER: Personally I wanted a system for massively parallel creative work and study;

WHY: A comma after "Personally" usually precedes the qualified, modest expression of an opinion: "Personally, I think she's after the money." In this case it was not modest, it was something I wanted very strongly. Also the sentence rhythm is not that of a Ted Nelson sentence. Read the two aloud:
"Personally, I wanted a system..." has a breathy pause;
"Personally I wanted a system..." does not. Much stronger, as goes with the strong emotion we're talking about here.

more grandly, I
sought to design the rightful literature and art canvas of the future, creating a technical, legal and commercial basis for a world-wide populist and participatory electronic literature of freely-weaving screen transmedia-- republishable and quotable without restriction-- to the betterment of human understanding and freedom of expression and access [1]. What better dream at twenty-three? And still a good idea now.

I STRONGLY PREFER:
And still a good idea.
The "now" changes the rhythm and makes it not a Ted Nelson sentence.

By 1960's end I had a design paradigm centering around deep intercomparison. The resulting system design (called since 1967 "Xanadu"*) has always been a unified scalable concept, both for personal work environments (managing private versions) and for hypermedia publishing-- that is, all publishing.

The central idea has always been what I now call transclusion, or re-use of material with awareness (virtual presence) of the original context.

I STRONGLY PREFER:
or re-use of material with other contexts available, through embedded instancing (rather than copying of bytes).

Thus the user may intercompare contexts of what is re-used, both for personal work (managing content) and publication (for deep comprehension and study).** Transclusion brings to electronic publishing a copyright method that makes republication fair and clean: Each user buys each quotation from its own publisher, assuring proper payment (and encouraging exploration of the original).

Contexts of transclusions must be visually comparable on screen (figure 1). (Unfortunately, today's windowing systems do not yet allow arrows and bands to cross frame boundaries,)

Fig. 1: Deep Intercomparison Viewing

Such intercomparative use at the center of all digital function meant building a new kind of file system (2, 3, 4). It would be hyperarchical, permitting the same material to be organized into simultaneous alternative structures-- hierarchies, sequences, hyperplexes. It could permit no embedded codes, would make all changes by optional additions and overlay all structure.

I STRONGLY PREFER:
by optional additions and structural overlay.

WHY: because not all structure is overlaid.

"Optional" here means that versions can fork, and you can re-use material without these changes. But no room to get into that.

As a deep revision server and project tracker for writers, scholars and programmers, it would manage re-use and instance comparison in all projects and publications. Users trying many possible organizational strategies could maintain all of them to express the unified fullness of their exact ideas. And this single-user console would scale up directly to groupware and commercial publishing system standards.

WOOPS! TOTAL MISUNDERSTANDING. *

CAN WE MAKE IT--
And this single-user console would scale up directly to groupware and the mighty on-line publishing server for tomorrow's transclusive all-media literature.

Since then, colleagues and I have implemented (in varying degrees) half a dozen server designs, improving granularity (especially editability of embedded instances), mechanisms of transclusion, mechanisms of versioning, and transvisibility (the ability to reach different instance portions from one another) [3]. Substantial funding was provided for a time by Autodesk, Inc. [4]

Of late I have rethought the system's core, which had always seemed irreducible. I now discern layers: project tracker engine, change manager, networking this and that, publication server, sale method, legal basis, etc. Separable specifications will help everyone to build systems of this class on a mix-or-match basis. I already have elucidated the copyright method-- actually an open permission system-- in a separate paper [5].

Like Doug Engelbart, I slog on with ideals held high above the mud. Ironically, Doug and I started from completely opposite premises: he to empower work groups and make them smarter, I to free the individual from group obtuseness and impediment. That we have converged on common ideas to any degree is astonishing, and shows, I think, their correctness and generality.

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** For sequences of discrete chunks, transclusion is isomorphic to multithreading items [2].

BIBLIOGRAPHY

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==========

DISCUSSION OF YOUR POINTS--

>These two angles fused into "stereo" with far-reaching consequences.

>- I'd prefer to remove the words <into "stereo">

See above.

>an interpenetrating world-wide populist electronic literature
>- you saw my changes: I found "interpenetrating" unclear. "Populist"
>stood too radical on its own.

Oh, all right.

>has always been a singular unified scalable concept
>- I took out the word "singular," you may wish to reinsert it.

Oh, all right.

>meant building a new kind of file system
>- should you reference [2] here, as well?

Good idea. Done, above, and I added 3 and 4.

>would make all changes by optional additions and handle all structure by
>optional overlay.
>- I don't know what you mean by "optional" in either of these cases.
>Please fix my fix.

See above note.

>Users trying many possible organizational strategies *needed to cut no
>connections*
>- I hope you don't mind me cutting your italics...

As well as the phrase. But okay, meaning's there.

> and the mighty publishing system
>- I don't know what you meant by this. You could replace this by:
>--- industrial strength publishing standards
> --- commercial publishing systems

NONE OF THE ABOVE! A transclusive hypermedia publishing network!
See change.

> XOC
>- is this the name of the corp, or should you spell out XOC?

This is the name of the corporation; it no longer has "Xanadu" in the name.

From bieber@cis-gw.njit.edu Fri Apr 14 14:32:16 1995
From: bieber@cis-gw.njit.edu (Michael Bieber)
Date: Fri, 14 Apr 1995 01:06:27 EDT
X-Mailer: Mail User's Shell (7.1.2 7/11/90)
To: ted@hyper.sec.or.jp
Subject: CACM: Next Version
Cc: bieber@cis.njit.edu
Content-Length: 7767

Hi Ted,

This is really great now. I have a few suggestions still. First I'll give a suggested new version. Below I've listed a bunch of questions/options. I haven't pointed out all the changes. I've added some punctuation and minor rewording. I assume you'll notice if I've done anything incorrectly. Of course, I've lost all your styles. Sorry.

Also I haven't seen your latest figures as I won't be in until next Wednesday.

Maybe we're finally at the last round!

By the way, I showed your latest fax to Murray Turoff, who thought it "amusing" that all your citations were recent except your 1965 paper, which Murray feels is your best paper. (Read: he agrees with you.)

In our research seminars Murray often brings up your ideas of stretch text. We may have a PhD student, Frederick Ferront, who may attempt to expand on and implement this as part of his dissertation.

Anyway, back to editing land...

Cheers,

Michael

P.S.

--> Do you want to put in contact information at all (anything up to and including email, fax, URL...)

--> Do you have a short bio-blurb up to 50 words we could use?

+++

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The central idea has always been what I now call transclusion, or re-use of material with awareness (virtual presence) of the original context. Thus the user may intercompare contexts of what is re-used, both for personal work (managing re-use) and publication (for deep comprehension and study).** Transclusion brings to electronic publishing a copyright method that makes republication fair and clean: Each user buys each quotation from its own publisher, assuring proper payment (and encouraging exploration of the original).

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+++

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- I'd prefer to remove the words <into "stereo">

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- you saw my changes: I found "interpenetrating" unclear. "Populist" stood too radical on its own.

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- I took out the word "singular," you may wish to reinsert it.

meant building a new kind of file system
- should you reference [2] here, as well?

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- I don't know what you mean by "optional" in either of these cases. Please fix my fix.

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- I hope you don't mind me cutting your italics...

and the mighty publishing system
- I don't know what you meant by this. You could replace this by:
--- industrial strength publishing standards
--- commercial publishing systems

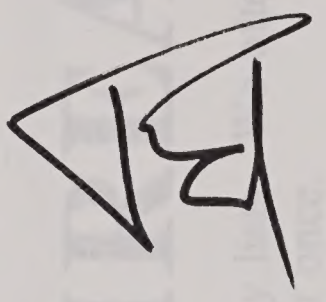
XOC
- is this the name of the corp, or should you spell out XOC?

Hi Michael--

MORE PICTURES, PARTIALLY RESPONDING TO YOUR EMAIL ABOUT THE PICTURES.

I'M AT THE LAB TO RESPOND, possibly to the end of your day (yaargh)-- no sleep in days.

rgds



Encl:

ZipVsThreadPic.d11
ZipVsThreadPic.d12

T

(sent 95.4.26 8:30 pm)

Theodor Holm Nelson *Founder of Interactive Media* *Founder of Network Publishing*
Project Xanadu® On-Line Storage and Publishing Agency
3020 Bridgeway #295, Sausalito CA 94965 415/ 331-4422 Fax 415/ 332-0136
e-mail ted@xanadu.net
and
Sapporo HyperLab Doshin Maruyama, 8F • 2-20, Odori Nishi 20-chome
Chuo-Ku, Sapporo-shi, Hokkaido 064 JAPAN
Tel. (from the States) 011 81 11 621-1133 Fax (from the States) 011 81 11 621-1170
e-mail ted@xanadu.net

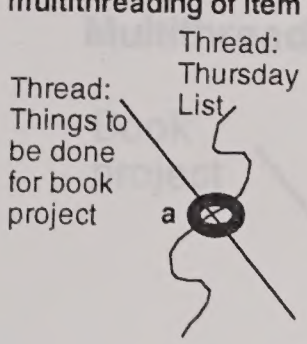
ZipVsMThreadPic.d11

(from xuviz.HO d7-10)

95.4.26

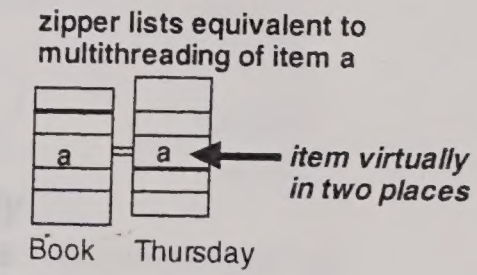
(04)

Introduction: MULTITHREADING



Often we need one item to be on many lists. We often want to see and understand both contexts at once.

ZIPPER LISTS (Nelson, 1965) proposed a user-comprehensible data structure and viewing mechanism for this, using column formats.

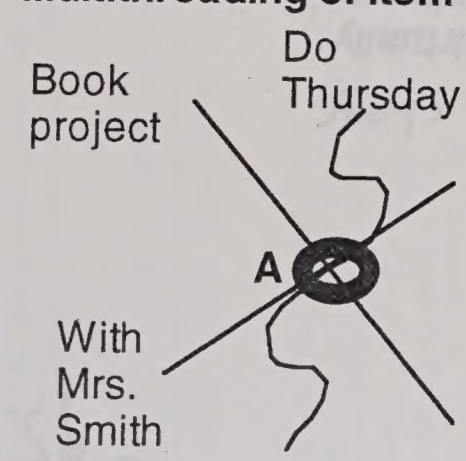


ZipVsMThreadPic.d12

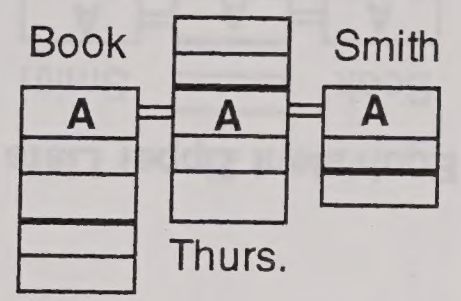
95.4.26

Zipper Lists: a data structure and viewing method for multithreading of items (Nelson, 1965).

Multithreading of Item A



Equivalent Zipper Lists



item A virtually in three places (transclusion)

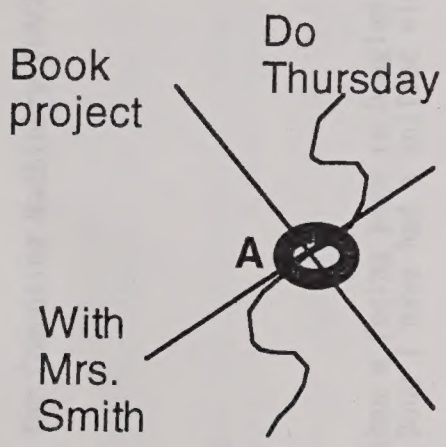
ZipVsMThreadPic.d12 → d13

95.4.26

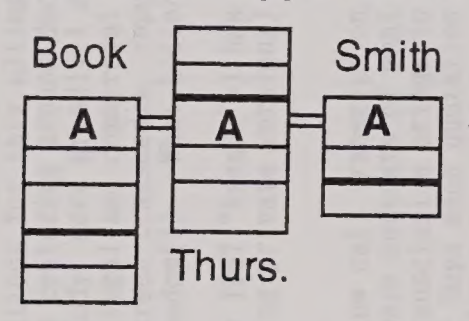
[moved in, 95.4.26]

Zipper Lists: a data structure and viewing method for multithreading of items (Nelson, 1965).

Multithreading of Item A

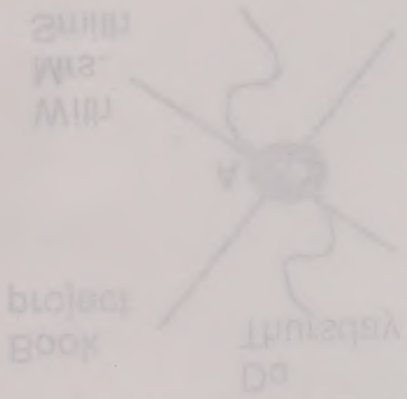


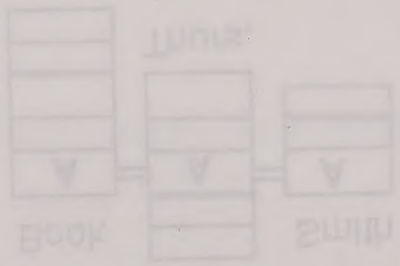
Equivalent Zipper Lists



display shows

item A virtually in three places (transclusion)





xacm.c1z.e20.txt

Date of this draft: 95.4.12

[PICTURES NOT INCLUDED]

Invited paper to appear in
Communications of the Association for Computing Machinery (CACM),
sometime in 1995,
opposite a corresponding paper
by Douglas C. Engelbart.

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xacm.clz

page 0

xacm.clz

page 0

faxed on 730 95.4.~~10~~ 11.

Fax to: Michael Bieber
Fax 201/596-5777

Afternoon Michael--

Herewith closing draft 18.

800 words, just like yours.

Pix fix follow. Finally thought of the good example.

Our damn Unix server is full, can't use email. Should be fixed within eight hours.

Thanks

T

Encl: xacm.clz.d18

Theodor Holm Nelson
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Project Xanadu®
3020 Bridgeway #295, Sausalito CA 94965
Tel. 415/ 331-4422 Fax 415/ 332-0136
e-mail ted@xanadu.net
and
Sapporo HyperLab Doshin Maruyama, 8F • 2-20, Odori Nishi 20-chome
Chuo-Ku, Sapporo-shi, Hokkaido 064 JAPAN
Tel. (from the States) 011 81 11 621-1133
Fax (from the States) 011 81 11 621-1170

Fax to: Michael Bieber
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Encl: xmen.dc.d18

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rgds

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ZipVsThreadPic.d12

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e-mail ted@xanadu.net
and
Sapporo HyperLab Doshin Maruyama, 8F • 2-20, Odori Nishi 20-chome
Chuo-Ku, Sapporo-shi, Hokkaido 064 JAPAN
Tel. (from the States) 011 81 11 621-1133 Fax (from the States) 011 81 11 621-1170
e-mail ted@xanadu.net

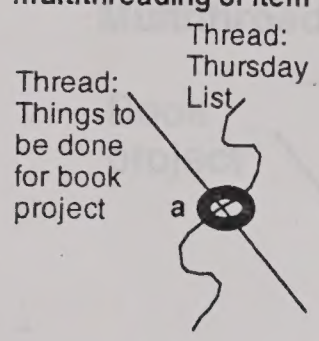
ZipVsMThreadPic.d11

(from xuviz.HO d7-10)

95.4.26

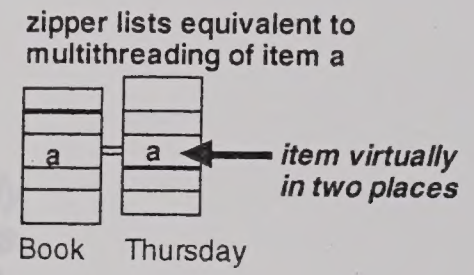
(04)

Introduction: MULTITHREADING



Often we need one item to be on many lists. We often want to see and understand both contexts at once.

ZIPPER LISTS (Nelson, 1965) proposed a user-comprehensible data structure and viewing mechanism for this, using column formats.



Introduction: MULTITASKING

ZipVsMThreadPic.d12

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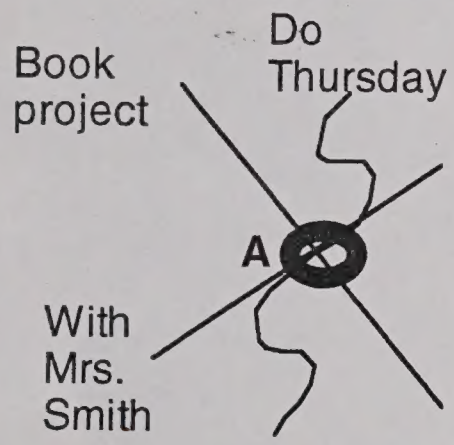
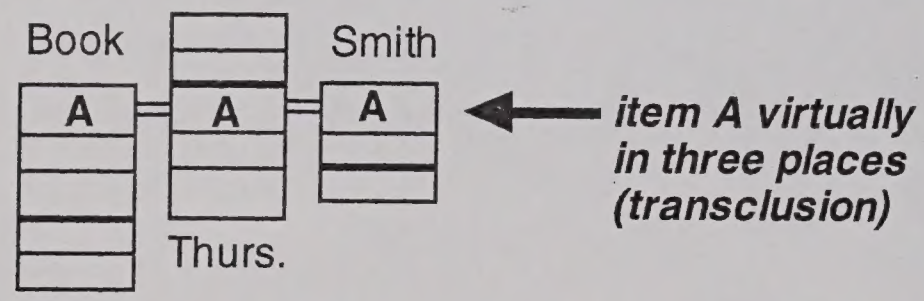
Zipper Lists: a data structure and viewing method for multithreading of items (Nelson, 1965).

Multithreading of Item A



Equivalent Zipper Lists



Value
Mean
Min
Project
Back
Max
Do

Min
Max
Back
Do

d18

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95.4.7

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faxed on 730 95.4.11.

Fax to: Michael Bieber
Fax 201/596-5777

Afternoon Michael--

Herewith closing draft 18.

800 words, just like yours.

Pix fix follow. Finally thought of the good example.

Our damn Unix server is full, can't use email. Should be fixed within eight hours.

Thanks

T

Encl: xacm.clz.d18

Theodor Holm Nelson
Founder of Interactive Media *Founder of Network Publishing*
Project Xanadu®
3020 Bridgeway #295, Sausalito CA 94965
Tel. 415/ 331-4422 Fax 415/ 332-0136
e-mail ted@xanadu.net
and
Sapporo HyperLab Doshin Maruyama, 8F • 2-20, Odori Nishi 20-chome
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Tel. (from the States) 011 81 11 621-1133
Fax (from the States) 011 81 11 621-1170

d18

(major outs)

page 1

95.4.7

800 words (text+ftnts+bib, not title)

[PICTURES WILL ARRIVE SEPARATELY]

Invited paper to appear in *Communications of the Association for Computing Machinery* (CACM), sometime in 1995, opposite a corresponding paper by Douglas C. Engelbart.

THE HEART OF CONNECTION: Hypermedia Unified by Transclusion

Theodor Holm Nelson

I can imagine few honors greater than a facing page to Douglas Engelbart's; he is one of the great men of our century and I love him dearly. Like Doug I have had a unified vision of which today's popular attainments are only centerless shadows of the edge.

But I have till now had little basis for conversation with the computer mainstream. Coining words has hardly helped (e.g., hypertext, hypermedia, transclusion). Let me begin again, for few have understood.

After college, wishing to work alone as rogue philosopher and film-maker, I was troubled about distribution for self-publishing

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(major outs)
page 1
95.4.7

THE HEART OF CONNECTION: Hypermedia Unified by Transclusion

Theodor Holm Nelson

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Sapporo HyperLab

and how to manage notes and threads for many projects. Then I took a computer course. Philosophically I saw that the computer was a clockwork of arbitrary abstractions designable any whichway; cinematically, I saw it would become the theater of all media turned interactive. These two angles fused into stereo with faraway consequences.

What would be the best underlying abstractions for this ultimate union and generalization of literature and movies? By 1960's end I had a design paradigm centering around *deep intercomparison.* Personally I wanted a system for massively parallel creative work and study; more grandly I sought to design the rightful literature and art canvas of the future, creating a technical, legal and commercial basis for an interpenetrating world-wide populist electronic literature of freely-weaving screen transmedia, republishable and quotable without restriction, to the betterment of human understanding and freedom(1). What better dream at twenty-three? And still a good idea.

The resulting system design (called since 1967 "Xanadu"*) has always been a singular unified scalable concept, both for personal work environments (managing private versions) and for hypermedia publishing-- that is, all publishing.

The central idea has always been what I now call *transclusion*, or re-use of material as instances embedded in new contexts. Re-used portions of material are kept identifiable and virtually connected. Thus the user may *intercompare contexts* of what is re-used.** Transclusion brings to electronic publishing a copyright method that makes re-use fair and clean: Each user buys each quotation from its own publisher, assuring proper payment and encouraging exploration of the original.

Contexts of transclusions must be visually comparable on screen (figure 1). (Unfortunately, today's windowing systems do not yet allow arrows and bands to cross frame boundaries,)

d18
(major outs)
page 2
95.4.7

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Sapporo HyperLab

Fig. 1: Deep Intercomparison Viewing

For such intercomparative use to be the center of all digital function meant building a new kind of file system.

It would be *hyperarchical*, permitting the same material to be organized at the same time into simultaneous alternative structures-- hierarchies, sequences, hyperplexes. It could permit no embedded codes, would make all changes by optional additions and handle all structure by optional overlay. As a deep revision server and project tracker for writers, scholars and programmers, it would manage re-use and instance comparison in all projects and publications. Users trying many possible organizational strategies *needed to cut no connections*, expressing the unified fullness of their exact ideas. And this single-user console would scale up directly to groupware and the mighty publishing system.

Since then, colleagues and I have implemented (in varying degrees) half a dozen server designs to various degrees, improving granularity (especially editability of embedded instances), mechanisms of transclusion, mechanisms of versioning, and transvisibility (the ability to reach different instance portions from one another).(3) Substantial funding was provided for a time by Autodesk, Inc.(4)

Of late I have rethought the system's core, which had always seemed irreducible. I now discern layers: project tracker engine, change manager, networking this and that, publication server, sale method, legal basis, etc. Separable specifications will help everyone to build systems of this class on a mix-or-match basis. The copyright method, actually an open permission system, has been elucidated in a separate paper (5).

Like Doug Engelbart, I slog on with ideals held high above the mud. Ironically, Doug and I started from completely opposite premises: he to empower work groups and make them smarter, I to free the individual from group obtuseness and impediment. That we have converged on common ideas to any degree is

page 3 xacm.cloz page 3 xacm.cloz page 3 xacm.cloz page 3 xacm.cloz page 3

astonishing, and shows, I think, their correctness and generality.

* "Xanadu," a name adopted about 1967, is a registered trademark of Project Xanadu.

** For sequences of discrete chunks, transclusion is isomorphic to multithreading. (2)

BIBLIOGRAPHY

1. Nelson, T., "Xanadu: Document Interconnection Enabling Re-Use with Automatic Author Credit and Royalty Accounting" *Information Services & Use* 14, 1994.

2. Nelson, T., "A File Structure for the Complex, the Changing and the Indeterminate." Proceedings of the ACM Twentieth National Conference, 1965.

3. Nelson, T., *Literary Machines*, various editions; most recent is Japanese translation, 1994, ASCII Press. Most recent English version *Literary Machines 93.1*, Mindful Press, Sausalito CA.

4. XOC, Inc., "Xanadu Hypermedia Server, Developer Documentation," Mindful Press, 1992.

5. Nelson, T. "Transcopyright: Pre-Permission for Virtual Republishing," 1995, unpublished.

astonishing, and shows, I think, their correctness and generality.

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** For sequences of discrete chunks, transclusion is isomorphic to multitransclusion. (2)

BIBLIOGRAPHY

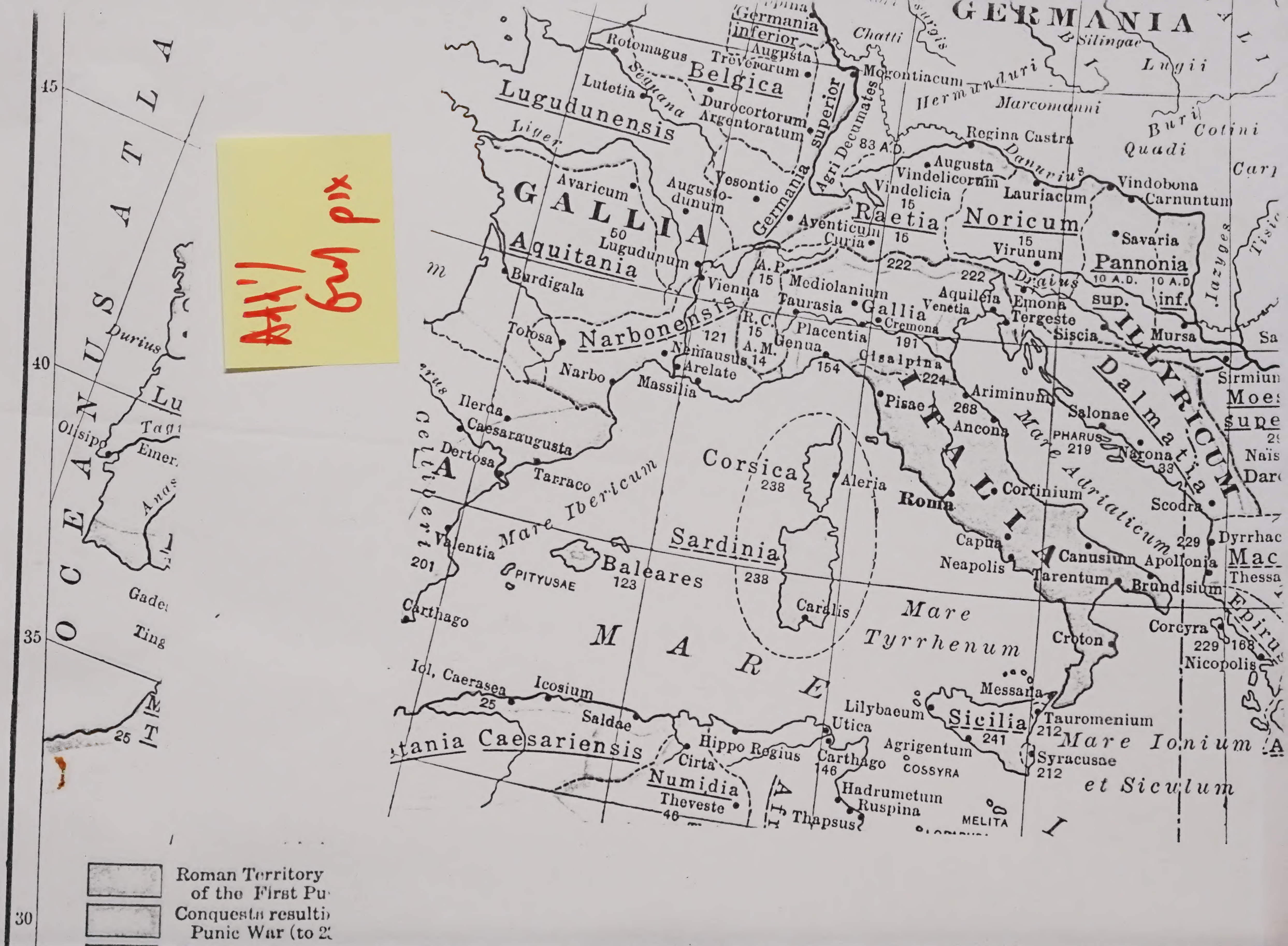
1. Nelson, T., "Xanadu: Document Interconnection Enabling Re-Use with Automatic Author Credit and Royalty Accounting" Information Services & Use 14, 1994.

2. Nelson, T., "A File Structure for the Complex, the Changing and the Indeterminate." Proceedings of the ACM Twentieth National Conference, 1965.

3. Nelson, T., Literary Machines, various editions; most recent is Japanese translation, 1994, ASCII Press. Most recent English version Literary Machines 93.1, Mindful Press, Sausalito CA.

4. XOC, Inc., "Xanadu Hypermedia Server, Developer Documentation," Mindful Press, 1992.

5. Nelson, T. "Transcopyright Pre-Permission for Virtual Republishing," 1995, unpublished.


OCEANUS ATLANTICUS
GERMANIA
GALLIA
Germania inferior
Germania superior
Belgica
Lugudunensis
Aquitania
Narbonensis
Agri Decumates
83 A.D.
Raetia
Noricum
Pannonia
Vindelicia
ILLYRICUM
Dalmatia
ITALIA
Gallia Cisalpina
Corsica
Sardinia
Baleares
Sicilia
Numidia
Caesariensis
Mare Ibericum
MARE
Mare Tyrrhenum
Mare Adriaticum
Mare Ionium et Siculum
Rotomagus
Treverorum
Augusta
Lutetia
Sequana
Durocortorum
Argentoratum
Mogontiacum
Chatti
Hermunduri
Marcomanni
Silingae
Lugii
Buri
Cotini
Quadi
Liger
Avaricum
Augustodunum
Vesontio
Lugudunum
Burdigala
Vienna
Tolosa
Narbo
Nemausus
Arelate
Massilia
Aventicum
Curia
A.P.
R.C.
A.M.
Mediolanium
Taurasia
Placentia
Genua
Cremona
Venetia
Aquileia
Emona
Tergeste
Siscia
Regina Castra
Augusta Vindelicorum
Lauriacum
Virunum
Danuvius
Dravus
Vindobona
Carnuntum
Savaria
Mursa
Sirmium
Iazyges
Pisae
Ariminum
Ancona
Salonae
PHARUS
Narona
Scodra
Corfinium
Roma
Capua
Neapolis
Canusium
Tarentum
Brundisium
Apollonia
Dyrrhachium
Corcyra
Nicopolis
Croton
Messana
Tauromenium
Syracusae
Agrigentum
Lilybaeum
COSSYRA
MELITA
Aleria
Caralis
Olisipo
Tagus
Emer.
Anas
Durius
Gades
Ting
Ilerda
Caesaraugusta
Dertosa
Tarraco
Valentia
PITYUSAE
Carthago
Iol, Caerasea
Icosium
Saldae
Hippo Regius
Cirta
Theveste
Utica
Hadrumetum
Ruspina
Thapsus
Roman Territory
of the First Pu
Conquests resulti
Punic War (to 2

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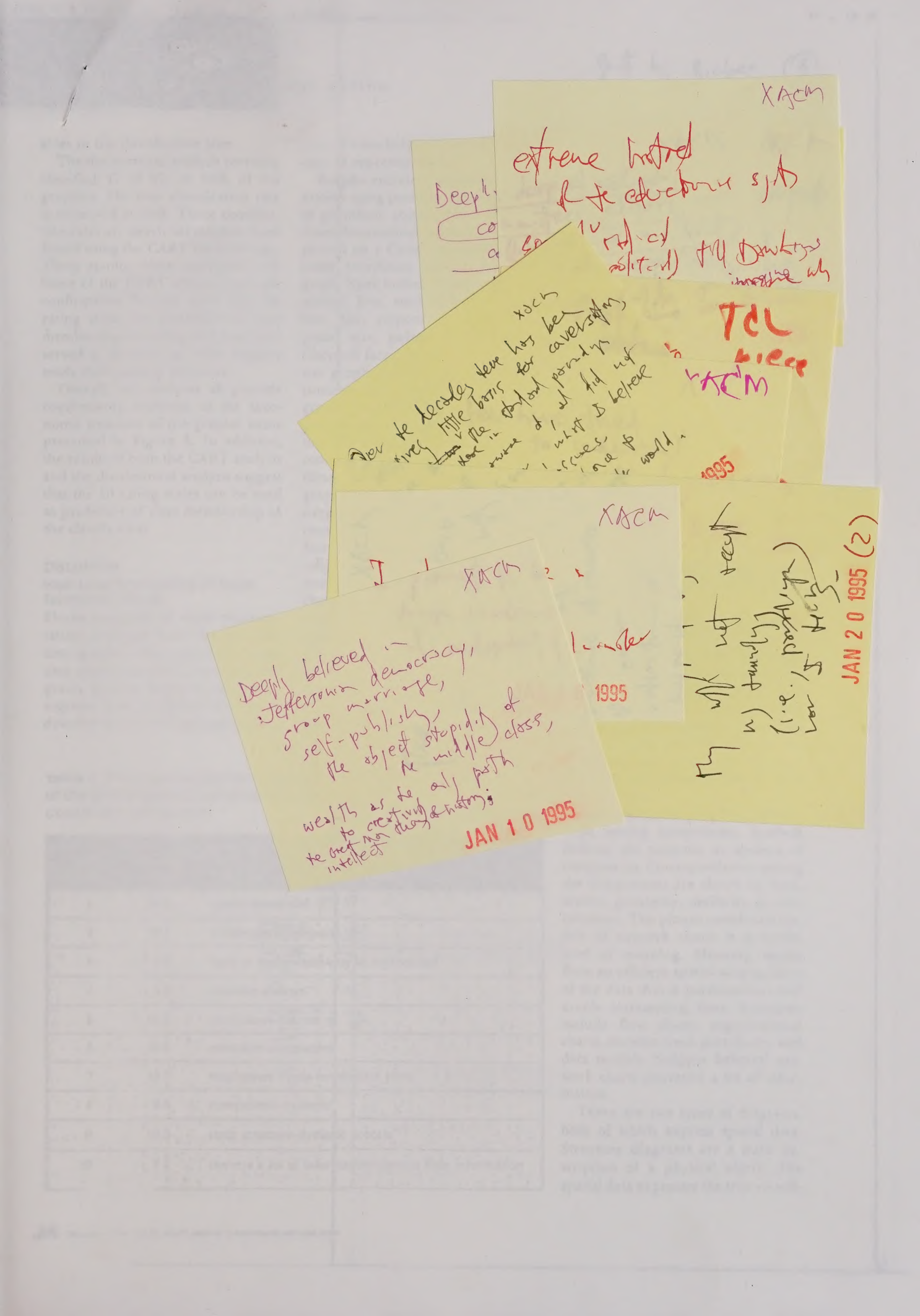

XACM
extreme hatred
of the educational system
TCL
XACM
1995
XACM
XACM
1995
Deeply believed in
Jeffersonian democracy,
group marriage,
self-publishing,
the abject stupidity of
the middle class,
wealth as the only path
to creativity & history;
the great man theory of
intellect
JAN 10 1995
JAN 20 1995 (2)

XθCh

There is little basis for creation with the current popular and academic discourse of either utopianism or hyperrealism; they will not accept my [illegible] (i.e., [illegible] [illegible])

JAN 2 0 1995 (2)

XθCM

I planned to be a fringe academic and independent filmmaker

JAN 1 0 1995

XθCh

Deeply believed in
Jeffersonian democracy,
group marriage,
self-publishing,
the abject stupidity of the middle class,
wealth as the only path to creativity,
the great man theory of history;
intellect

JAN 1 0 1995

XACM

Creative control over project
had long shaped up
as a ~~key~~ main issue
in my life.

JAN 1 0 1995

Fist TCL
setting piece

Let me
begin again

NOV 2 0 1994

XACM

extreme hatred
of the education sys
social (not political) fully Dantesque
JAN 1 0 1995 could/can't imagine why
ever not more

XACM

few have tried
to understand
my pt of view

JAN 1 6 1995

XACM

Over the decades there has been
relatively little basis for conversation,
since ~~there~~ the standard postures
were not ~~assumed~~, all did not
want to know, what I believe
& how to live issues.
There is, I feel, a deep
need for a new poetic world.

FEB 1 1995

XACM

Deeply despised ~~school~~
committees, editors,
collaboration of any kind
middle-class respectability
and school (not college,
for there one could be
unique, free),
middle-class smugness.

JAN 1 0 1995

Sent by Bieber (B)

ables in the classification tree.

The discriminant analysis correctly classified 47 of 57, or 83%, of the graphics. The true classification rate is estimated at 56%. These classification rates are nearly identical to those found using the CART methodology. These results, when combined with those of the CART analysis, provide confirmation for our belief that the rating scales are predictive of class membership in sorting and may have served as the basis on which subjects made their sorting decisions.

Overall, our analyses all provide confirmatory evidence of the taxonomic structure of the graphic items presented in Figure 3. In addition, the results of both the CART analysis and the discriminant analysis suggest that the 10 rating scales can be used as predictors of class membership in the classification.

Discussion

High-Level Descriptions of Major Taxonomic Groups

Eleven categories of visual representations emerged from the classification: graphs, tables, graphical tables, time charts, networks, structure diagrams, process diagrams, maps, cartograms, icons, and pictures. Here we describe these major groups and the type of knowledge conveyed by each class of representation.

Graphs encode quantitative information using position and magnitude of geometric objects. One-, two-, or three-dimensional numerical data is plotted on a Cartesian coordinate or polar coordinate system. Common graph types include scatterplot, categorical, line, stacked bar, bar, pie, box, fan, response surface, histogram, star, polar coordinate, and Chernoff face graphs. Except for the star graph (number 56) and the gas concentration graph (number 47), all graphs formed a single cluster. The gas concentration graph was a singleton. The novel format of the gas concentration graph lacked polar or rectilinear axes normally associated with graphs. This may have prevented subjects from grouping the gas concentration graph with other graphs. Star charts resemble pie charts, but subjects did not cluster these items in one group. Subjects grouped star charts with cartograms perhaps because both convey information from a spatial pattern created by the data. Graphs emphasize the whole display as compared with tabular data that emphasize parts of the display.

Tables are an arrangement of words, numbers, signs, or combinations of them to exhibit a set of facts or relationships in a compact format. Tables have less abstract symbolic notation than graphs. For example, tables usually do not contain a legend for mapping symbolic information to semantic information, whereas graphs often contain a legend to accomplish this task. Two groups of tables appeared in the classification: graphical and numerical. The primary distinction depended on how numeric information is coded in the table. Graphical tables, like the auto repair records (number 7), used shading to encode frequency of repair data, whereas the statistical table of the critical values of the t statistic (number 21) shows only numeric data. Numerical tables emphasize parts of the whole representation (e.g., individual data values). Subjects believed numerical tables conveyed a lot of information in an unattractive format but that graphical tables conveyed a lot of information in an attractive format.

Time charts display temporal data. They differ from tables in their emphasis on temporal data. Examples include the Gantt chart (number 14) and the time schedule of Olympic events (number 55). Both examples include graphical objects. The Gantt chart includes bars to indicate the length of an event; the Olympic schedule uses icons to identify each type of event.

Network charts show the relationships among components. Symbols indicate the presence or absence of components. Correspondences among the components are shown by lines, arrows, proximity, similarity, or containment. The planar coordinate system of network charts is generally void of meaning. Meaning results from an efficient spatial arrangement of the data that is parsimonious and avoids intersecting lines. Examples include flow charts, organizational charts, decision trees, pert charts, and data models. Subjects believed network charts conveyed a lot of information.

There are two types of diagrams, both of which express spatial data. **Structure diagrams** are a static description of a physical object. The spatial data expresses the true coordi-

Table 1. Principal components analysis showing percentage of the total explained variance for each of the ten scales used in the ratings task

Scale number	Percent variance	Scale description
1	11.5	spatial-nonspatial
2	10.1	nontemporal-temporal
3	9.6	hard to understand-easy to understand
4	9.9	concrete-abstract
5	10.5	continuous-discrete
6	10.3	attractive-unattractive
7	16.0	emphasizes whole-emphasizes parts
8	9.5	nonnumeric-numeric
9	10.6	static structure-dynamic process
10	2.2	conveys a lot of information-conveys little information

Cut by Bieber ®

edge with the left edge of the previous line, and the command centerline centers the line relative to the previous line. These two commands move the line rigidly, without changing the interword spacing.

Multilingual Text Editing

Documents containing material in writing systems other than the Roman alphabet (e.g., Japanese or Russian), as well as those using specialized graphical notations (e.g., mathematics or icons for chess pieces) present a challenge to document processing systems founded on the philosophy of format conversion. Each new type of embedded material increases the difficulty of the recognition task and the complexity of the resulting representation. Moreover, format conversion is typically an all-or-nothing proposition, so that inability to transcribe some material (e.g., if it uses a writing system that the recognizer cannot handle) implies the material cannot be edited and usually means it cannot even be reproduced.

Image EMACS, by contrast, is based on a principle of minimal (or partial) interpretation in which a text image is interpreted only to the extent necessary to support a specific set of text editing operations. As previously discussed, Image EMACS analyzes a text image into a vertical sequence of "lines," where each line is a horizontal sequence of "characters." A line is defined as a horizontal strip of image that is bounded above and below by blank rows. Similarly, a character is defined as a collection of image-connected components assembled according to simple grouping rules. Thus, the terms "line" and "character," while suggestive of rich semantics, actually correspond to relatively weak assumptions about the geometric structure of typeset English.

The geometric assumptions underlying Image EMACS are satisfied by the written forms of many languages besides English, as well as by notational systems other than typeset text. Thus, although Image EMACS was originally developed for editing images of typeset English, it is applicable to a much larger class of documents, including those containing more than one writing system. Moreover, if the assumptions underlying Image EMACS fail for some portion of an image, other regions can still be edited. Furthermore, even those regions for which the analysis fails can be reproduced with full fidelity. The analysis performed by Image EMACS is always invertible, so that *analysis "success" or "failure" refers not to the completeness of the resulting representation, but rather to the degree to which the structure of the representation matches the user's conceptual model of the material.*

Figure 5(a) shows examples of Chinese and Vietnamese text containing embedded English numerals. Figure 5(b) shows the result of editing the embedded text to replace occurrences of '586' with '510' and '330' with '310.' Because the geometric layout of the text satisfies the Image EMACS assumptions about line structure, the image was correctly parsed into a sequence of four lines. The individual connected components of most of the Vietnamese and Chinese characters were correctly grouped. A few of the Chinese characters comprise component subgroups that are separated by an all-white vertical column; these were erroneously broken into two separate characters. Most importantly, the English numerals were correctly identified as individual characters, which enabled successful editing. The appearance of the remainder of the text was preserved, even though the analysis was partly in error.

Table 1. Examples of Image EMACS linear text editing commands.

Cursor Movement Commands
move-to-end-of-line
move-to-next-char
move-to-next-line
move-to-next-word
move-to-end-of-buffer
move-to-mouse
Insertion and Deletion Commands
delete-char
cut-line
cut-region
cut-word
paste-cut-text
copy-mouse-char
Key Binding Commands
teach-chars
key-bindings-from-font
key-bindings-to-buffer
key-bindings-from-buffer
search-for-string

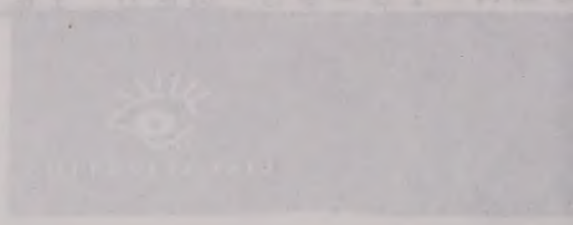
Text Reformatting

The appearance of a given page of text results from combining a stream of textual material (the "content" of the document) with the formatting information that determines the positioning and layout of the material. Image EMACS can be used to modify the layout structure of scanned text without disturbing the content or font of the text. This type of reformatting can be used, for example, to collect the text of an article that hopscotches across several pages of a magazine onto a single page. Compared with a conventional document recognition approach to this problem, reformatting at the image level is guaranteed to introduce no content errors and will preserve more aspects of the "look" of the original material, such as unique fonts.

Figure 6 shows the result of using Image EMACS to reformat the text in Figure 1 into a slightly wider column. This operation involves performing enough image analysis to represent the image as a sequence of lines of word-sized units, but does not necessarily require complete segmentation into characters. One exception is that hyphens at the ends of lines must be isolated so that they can be removed if necessary. In this example, the hyphens were manually removed; a more sophisticated system might perform enough character recognition to detect hyphenation automatically.

Differential Text Comparison

Differential text comparison is a useful tool for identifying editing changes in scenarios such as exchanging document drafts with a coauthor or comparing successive releases of source code or documentation. The objective of text image comparison is to summarize the changes between two separately scanned versions of a text document. Figure 7 shows a



New Jersey Institute of Technology

Department of Computer & Information Science
Ext ____

MEMORANDUM

Weds.

Hi Ted,

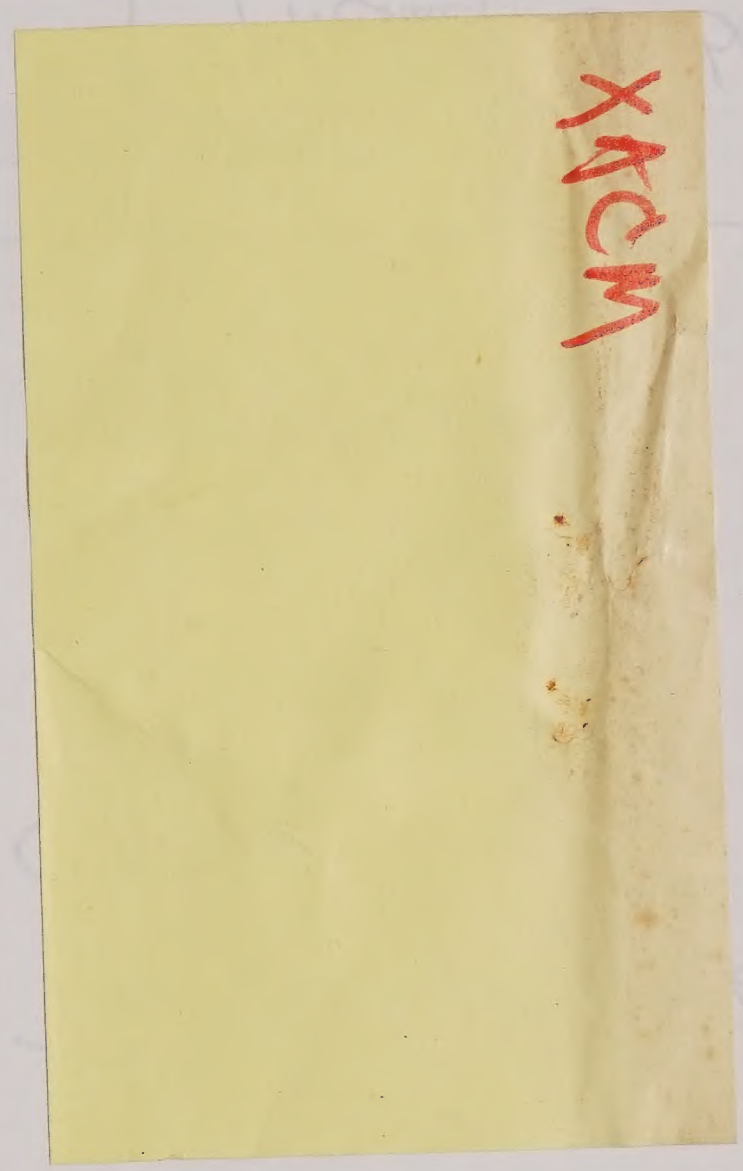
Here are the sample pages from the CACM.

Cheers,

Michael

For
Ted Nelson
(011 81) 11 621-1170

From
Michael Bieber
bieber@cis.njit.edu
(201) 596-2681 (w)
(908) 233-3245 (h)


XACM

xacm.HO

after nofacets.e16
e17 e18 e19 e20 e21 e22 e23 e24 e25 e26 e27 e28 e29 e30 31
e33 e34

95.2.26

HO AT END ==========
==========

HO TITLE _____

MY LIFE AND WORK

HYPERMEDIA VISION: Literature Unified by Transclusion

HYPERMEDIA: TOMORROW's UNIFIED LITERATURE

HYPERMEDIA OF TOMORROW: The Transclusive Docuverse

HO COUNTERPARADIGM _____

EVOLUTION AND INTERCOMPARISON
TRANSCLUSIVE EVOLUTIONARY RE-USE AND INTERCOMPARISON

Things that have in one way or another come out of my work miss its center.

Things that have in one way or another come out of my work miss its center.

(PIC: transclusion at center of: e-mail, word processing, hypermedia, electronic publishing)
[========]
[ ]
[ ]
[========]
To skip pic say: These have been for me kernels on a common cob.

publishing system and its required copyright permission system.

HO BACKGROUND _____

AFTER COLLEGE _____

THE FIRST REVELATION __

I also loathed Respectability (the suppression of creativity and feeling to avoid criticism), whose apparatus held back innovation, oversimplified and dumbed down the world.

Also that academic and non-profit auspices enacted the stupidities of the shallow middle class;

Ideas and innovation were suppressed by the shallow middle class.

from office equipment to marriage was designed wrong.

deeply concerned about the loss of documents and films.

My religion: human creativity, inspiration, freedom and posterity; the interconnectedness of everything

whose benefits I soon doubted

of this vast new expanse/realm.

HO REVELATION _____

led me to recognize the computer at once

MODEL OF LIT & VIEWPOINTS

hypertext/hypermedia (there being no exact border between them)

YOU THE AUTHOR MAY SAY WHAT YOU THINK

I was soon doubtful of the benefits people foresaw for "information retrieval."

Many technical people have supposed that documents can be dipped

As I considered these matters great and small, the glint of a central method showed itself to me, the flashing facet of a crystal seed.

(in the broader sense, all media objects.)

In this newly-opening world,

crystal seed/quark/pivot/kernel/crystallized design,

corner of this great echoing hyperverse.

STRUCTURAL TRANSCLUSION.

in an exploratory world

such unfortunate developments as link anchors, HTML or Microsoft Word.)

TRANSMEDIA*) for media developed in such an environment of rework and intercomparison,

At the down-and-dirty detail level,

I wanted to try different arrangements and drafts,

(often in variant drafts and designs)?

THE SECOND REVELATION

THE CRYSTAL SEED/QUARK/PIVOT/KERNEL ___

the secret being an orderly basic structure.

THE CONDENSING ANSWER _____

jumbled down and set into a single pivot

This centered around
This pivoted around a single generalized concept,
a single pivot:

TRANSMEDIA*) for media developed in such an environment of rework and intercomparison

And this would indeed be the crowning system of literature

What about being able to re-use and rework them?

VIEWING TOGETHER

But that did not mean it was just a small-scale single-user system.

and each quoting re-use (transclusion) transvisible among all instances.

HISTORY _____ The history through 1988 is in a book.*bib* My own early designs were at the technical level modest. Persevering into the 1970s, I made theoretical breakthroughs (algorithms and data structures) with various others, and

After the collapse of major funding by Autodesk in 1992

but recently that project has fallen into into some disarray. Whether those most excellent designs can be resusc

iated is uncertain.

definitions under which candidate software can be accepted under the trademark.

(most notably and in chronological order)

but as I persevered into the 1970s and beyond,

HO IRV _____

Artistic Model of completion: nothing is ever completed

HO PROJECT _____

and licensed to Filoli, Inc. and the author.

Personally designed

(especially transclusive,
parallel,
intercomparative
--not yet existent)

with bridges of linkage and commonality for such an evolution and intercomparison environment

version management and intercomparison,

paralley transclusive hypermedia and intercomparison,

but interfering with no other systems of delegating copyright.

Such a literature is designed for universal instantaneous access

intended as a licensed or franchised network of servers and stands

unified policy and a high-grade uniform service, like McDonald's.

This then was perfect.

Thus deadlines would be a thing of the past.

in every sensory modality,

This should trouble any concerned citizen.

project evolution

The server would handle registration of input items

but a few have understood and helped along the way. [TOO WEAK]

THE CREATIVITY CONSOLE

Xanadu would be a unified system for PARALLEL TRANSCLUSIVE INTERCOMPARISON,

royalty for all the bytes bought, whether in original or quoted form.

SERVER MODEL HST _____

A redesign, possibly ill-advised,

The edit changes
The single-user server with edit changes

Regretfully let go of maintaining changes...
maintaining all versions, and transclusion between them,

MAJOR BACKING AND COLLAPSE _____

THE BIG RETHINK _____

& MODEL OF TRANSPUB DOCT & STRUX _____

Publishing LEGAL model is a permission system on the bytes (now TRANSCOPYRIGHT)

whether to fundamentalists, small wars

(as at the Uffizi Gallery recently

I undertook this project alone with little hope of explaining it to others; but

as I persevered into the 1970s and beyond,

Partly from my deep mistrust of pompous nonprofit auspices,

while the server under development was kept under low-steam development by Roger Gregory at XOC, Inc., and elsewhere.

rethinking it into a set of separable layers was a daunting task.

"Xanadu" software to be obtained from the open market.

The well-behaved republisher has permission to transmit only stripped-down versions

I came up with new models that surprised me.

Separate out the detailed editing tracker from the publication model

I was surprised to realize that a publishing server on this model could exist without edit change

it had to be done on a paid-for basis.

The publishing doctrine had mistakenly been tied to technicalities

but that could now be much simpler than our designs.)

SOME implementation is required,

HO END _____

will be the first casualties of either fundamentalists or small nuclear wars, which I believe are very likely.

To be on facing pages with Doug Engelbart should be enough honor for any other man.

Naturally, Doug wants to form a committee and I still want to work mostly alone/ want to be mostly left alone.

Disagreements with Doug
indiv. not group
(I particularly loathed working with others in any way whatsoever)
publishing
command language
visualizations

PRAISE DOUG, his greatness, say I love him.

Say it is to me astonishing that he and I happen to converge to whatever degree.

which is why we need a pluralistic world.

The curious parallels between Doug Engelbart's work and mine has do do with scope of vision

the pluralistic world that still needs vastly better tools to support its pluralism.

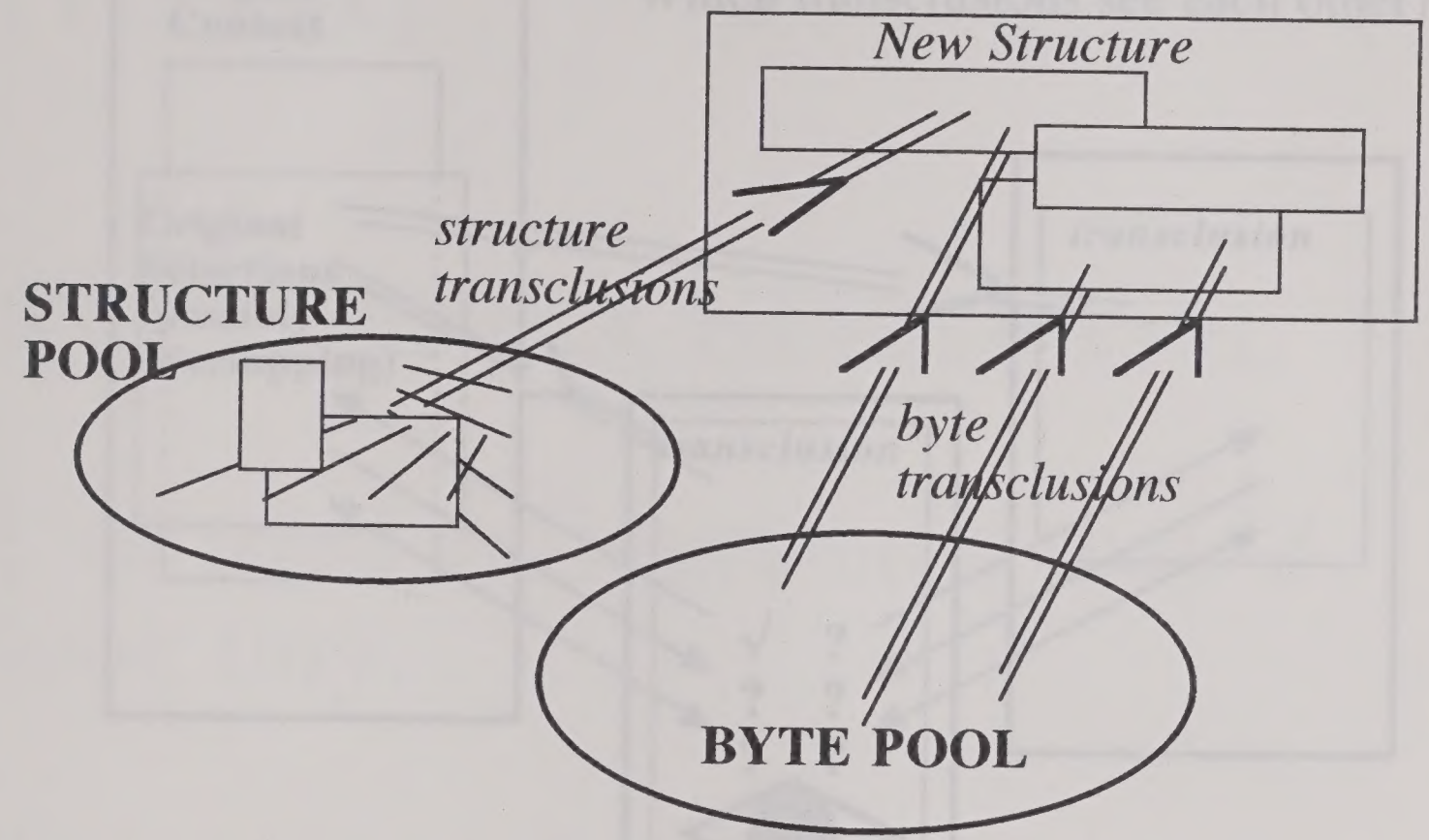
The curious parallels between Doug Engelbart's work and mine

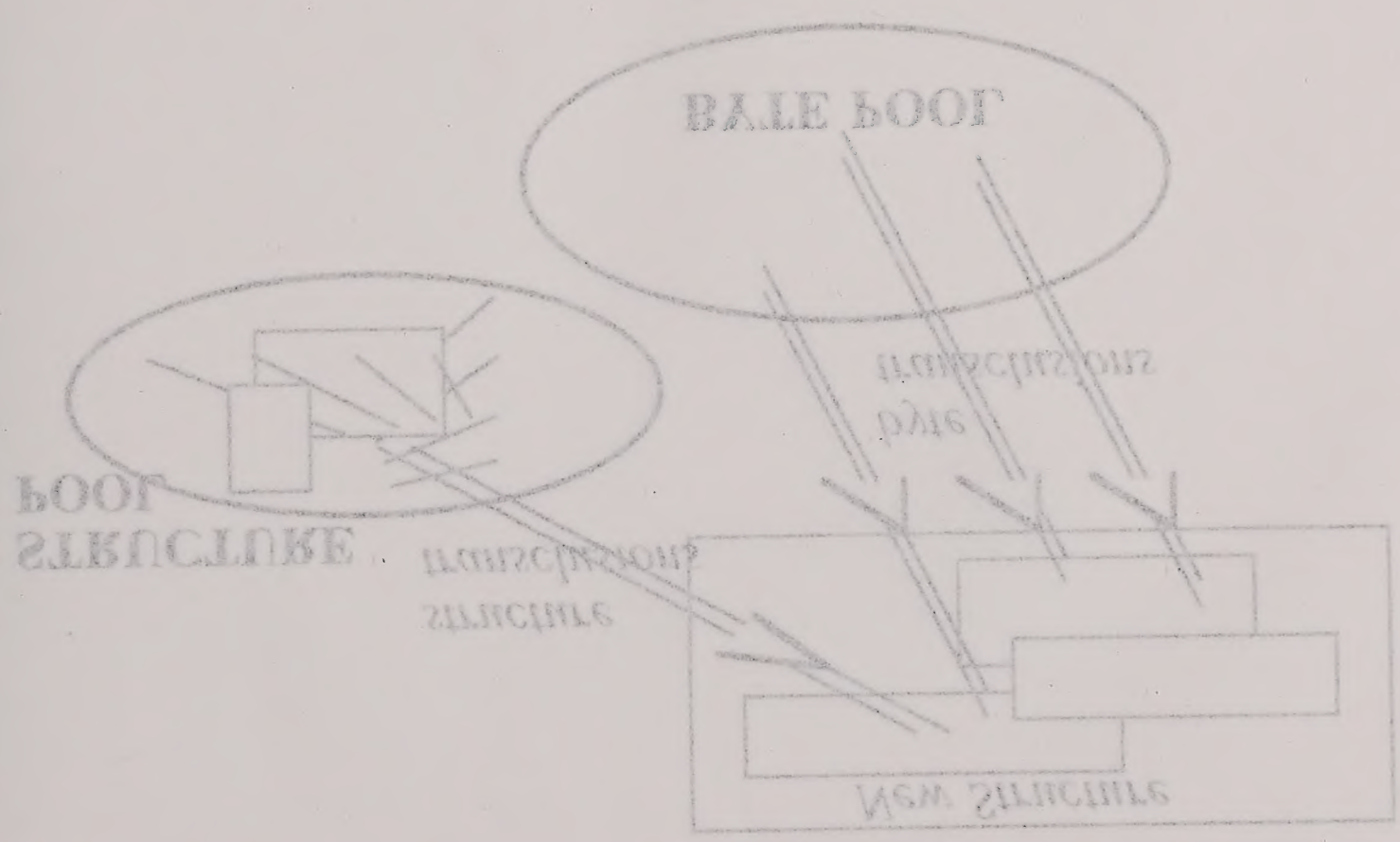
There is also a curious disparallel,

HO BIB _____

"The Meaning of Human Life,"

BYTES AND STRUCTURES, SEPARATELY STORED, MAY BOTH BE TRANSCLUDED



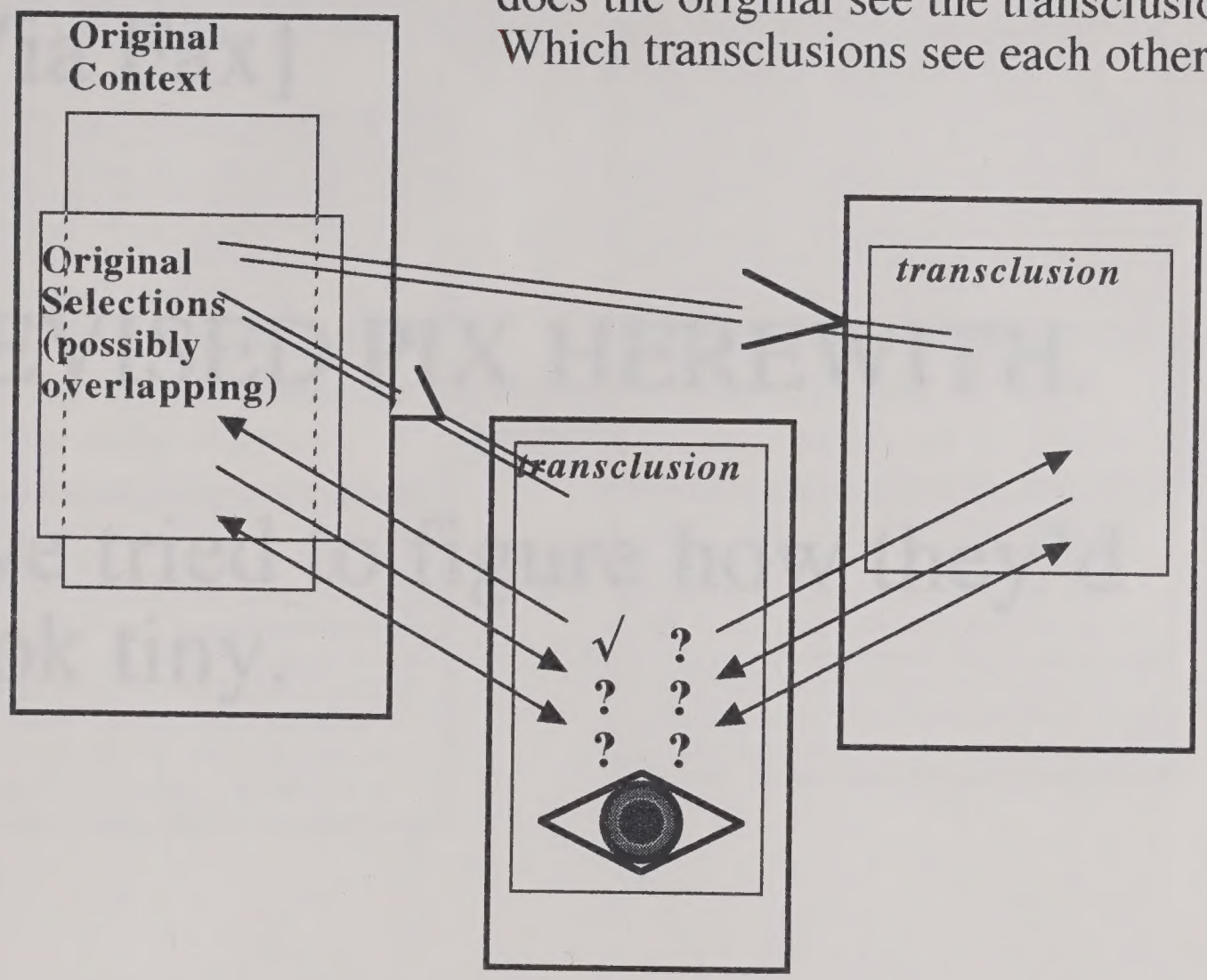


MAY BOTH BE TRANSCLUDED
BYTES AND STRUCTURES, SEPARATELY STORED

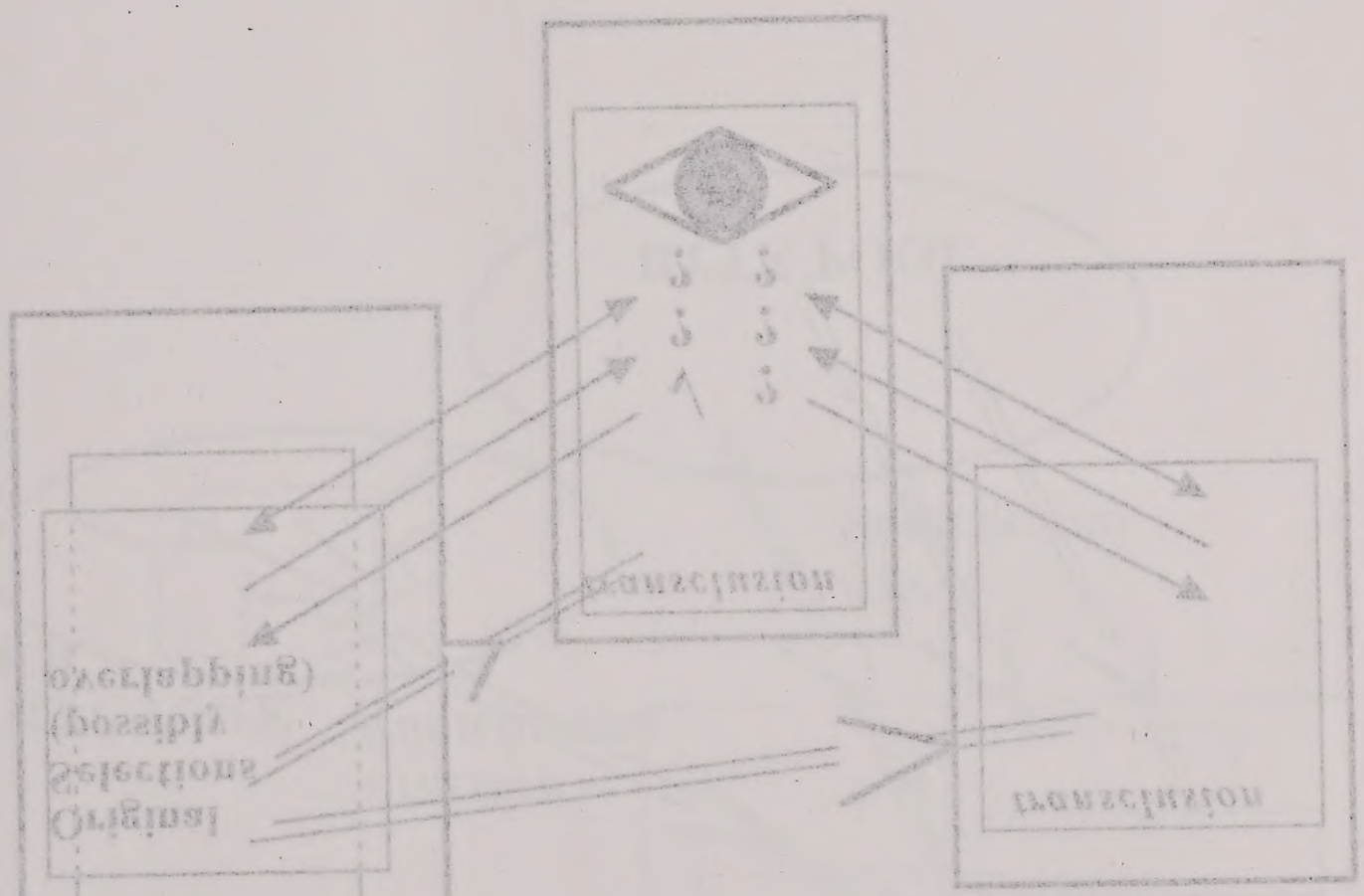
TRANSVISIBILITY

A KEY VARIABLE OF TRANSCLUSIVE SYSTEMS

Each transclusion sees its original;
does the original see the transclusion?
Which transclusions see each other?



encl: xacm.transviewing.d12


Context
Original
Which transitions see each other?
does the original see the transition?
Each transition sees its original.
TRANSPARENCY

[Via Fax]

REVISED PIX HEREWITH.

I've tried to figure how they'd look tiny.

T

encl: xacm.transviewing.d12

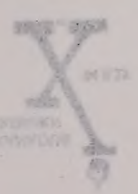
Theodor Holm Nelson *Founder of Interactive Media* *Founder of Network Publishing*
Project Xanadu® On-Line Storage and Publishing Agency
3020 Bridgeway #295, Sausalito CA 94965 415/ 331-4422 Fax 415/ 332-0136
e-mail ted@xanadu.net
and
Sapporo HyperLab **Doshin Maruyama, 8F • 2-20, Odori Nishi 20-chome**
Chuo-Ku, Sapporo-shi, Hokkaido 064 JAPAN
Tel. (from the States) 011 81 11 621-1133 Fax (from the States) 011 81 11 621-1170
e-mail ted@xanadu.net

T

look this.
I've tried to figure how they'd

REVISED FIX HEREWITH.

[Via Fax]



Project Xanadu® On-line Storage and Duplicating Agency
Theodor Holm Nelson Journal of Interactive Media Journal of Advanced Duplicating

3850 Bridgeway #295, Sausalito CA 94965 415\ 331-4453 Fax 415\ 332-0130

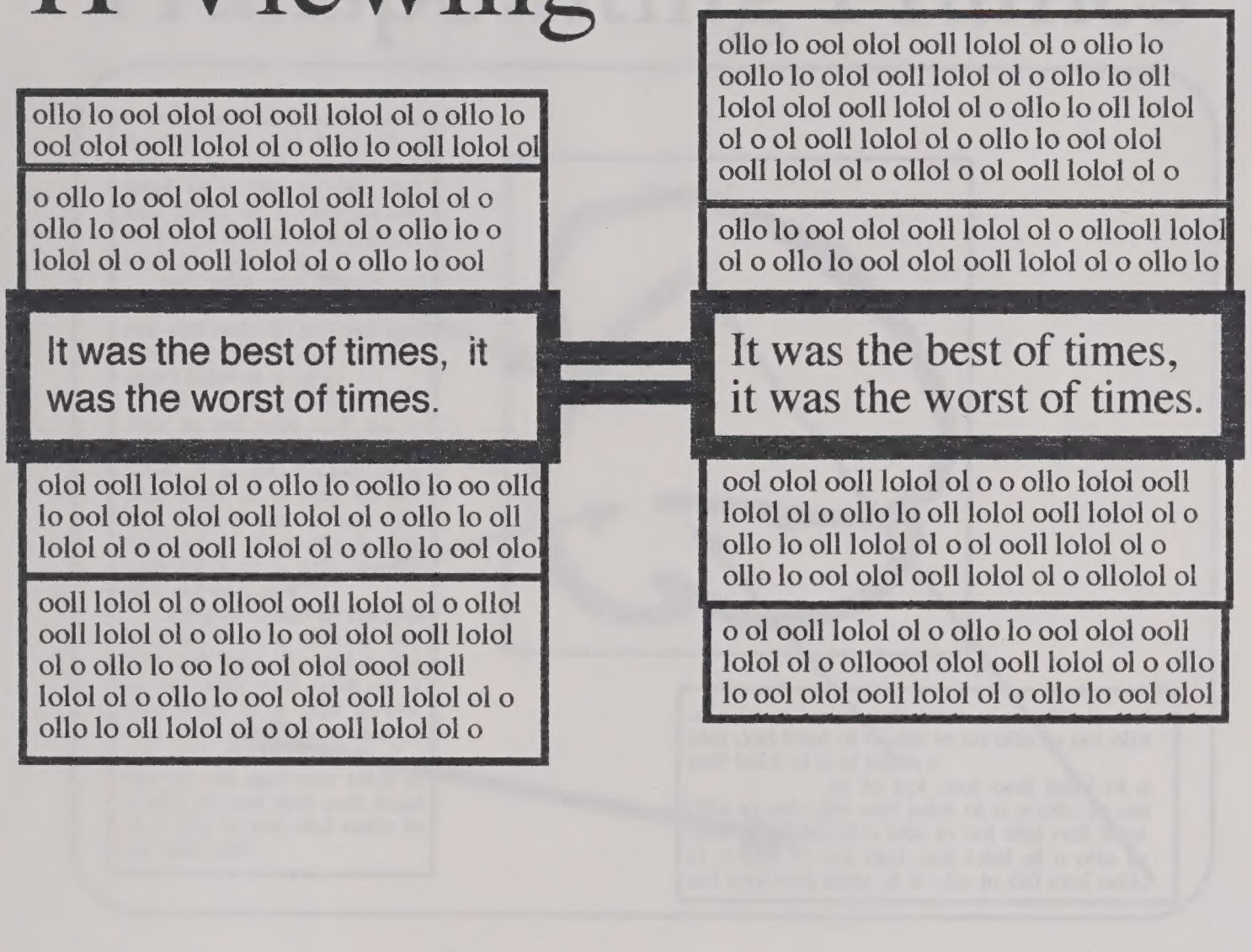
e-mail tedn@xanadu.net

and

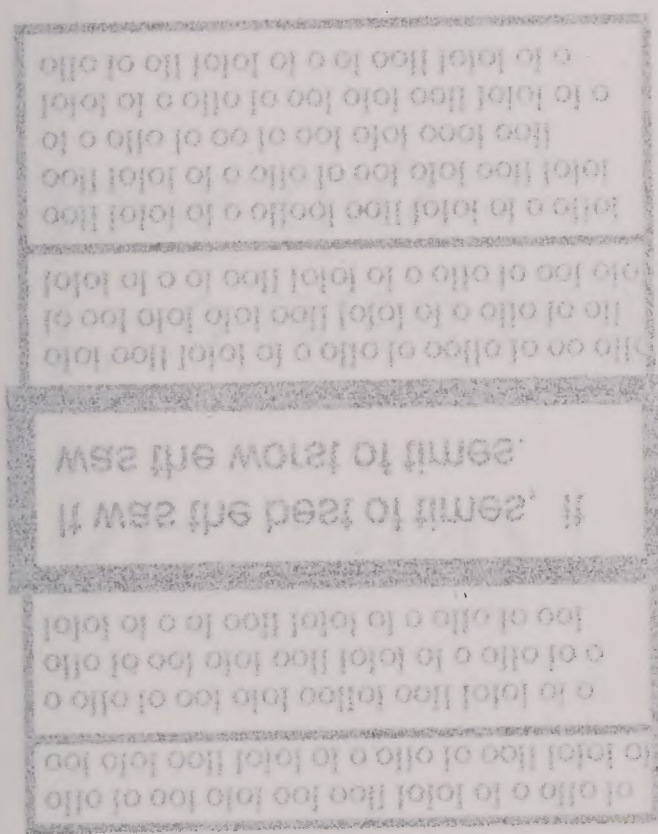
Support HyperLand Dosaku Matsuzawa, EK 3-30, Odori Nishi 30-chome
Chuo-Ku, Sapporo-shi, Hokkaido 064 JAPAN
Tel. (from the States) 011 81 11 631-1134 Fax (from the States) 011 81 11 631-1130

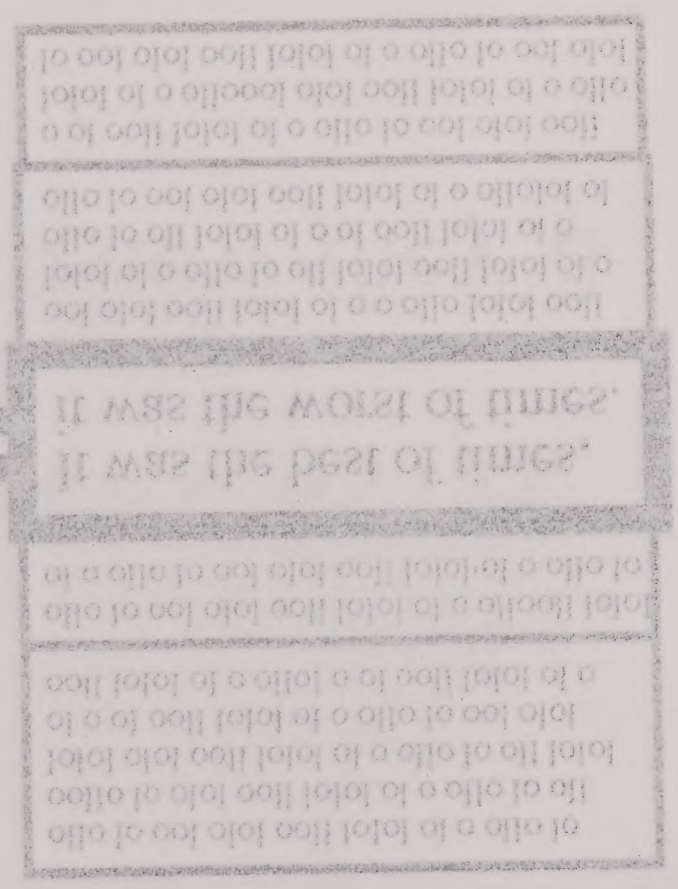
e-mail tedn@xanadu.net

H-Viewing

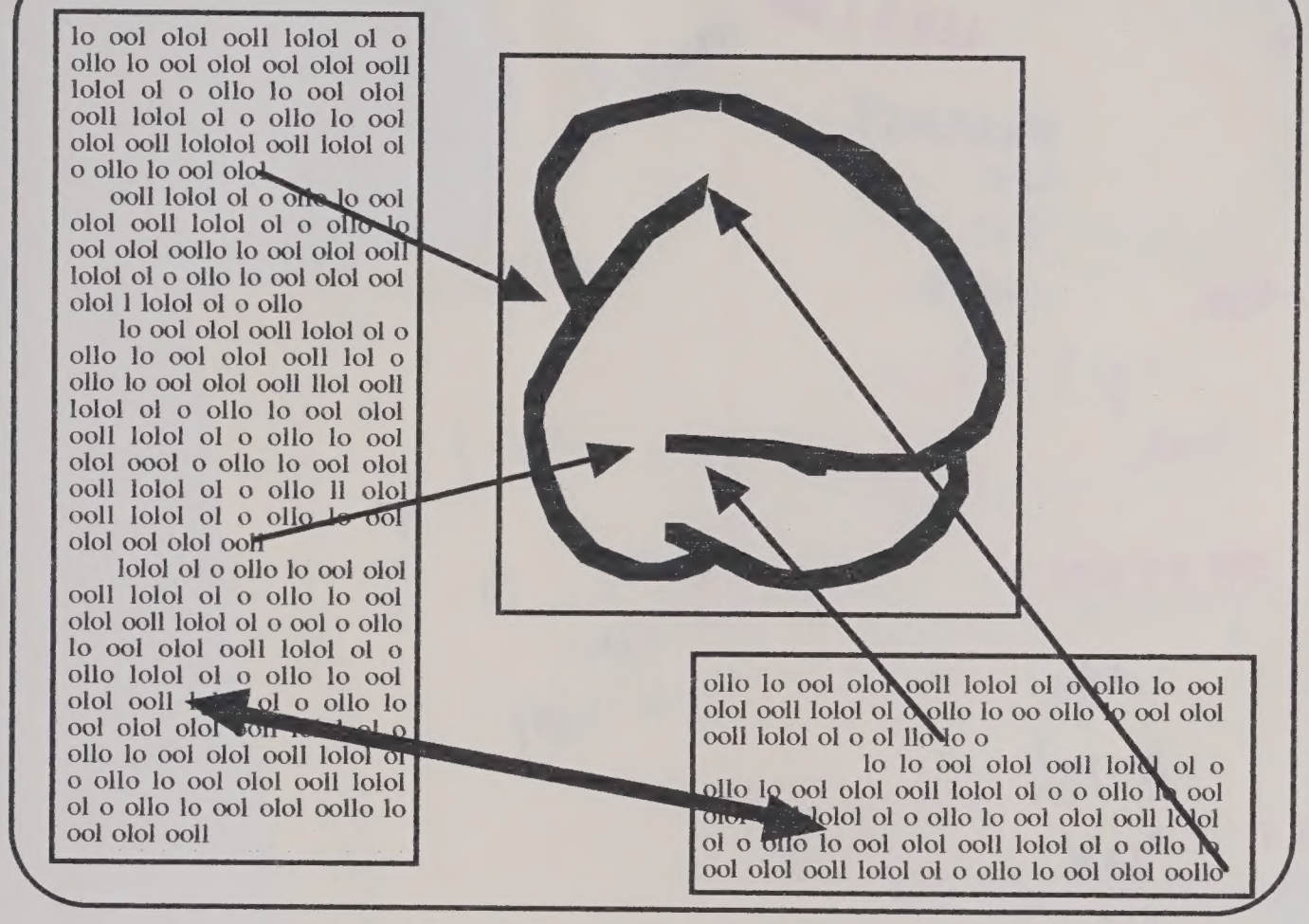

ollo lo ool olol ool ooll lolol ol o ollo lo ool olol ooll lolol ol o ollo lo ooll lolol ol
o ollo lo ool olol oollol ooll lolol ol o ollo lo ool olol ooll lolol ol o ollo lo o lolol ol o ol ooll lolol ol o ollo lo ool
It was the best of times, it was the worst of times.
olol ooll lolol ol o ollo lo oollo lo oo ollo lo ool olol olol ooll lolol ol o ollo lo oll lolol ol o ol ooll lolol ol o ollo lo ool olo
ooll lolol ol o ollool ooll lolol ol o ollol ooll lolol ol o ollo lo ool olol ooll lolol ol o ollo lo oo lo ool olol oool ooll lolol ol o ollo lo ool olol ooll lolol ol o ollo lo oll lolol ol o ol ooll lolol ol o
ollo lo ool olol ooll lolol ol o ollo lo oollo lo olol ooll lolol ol o ollo lo oll lolol olol ooll lolol ol o ollo lo oll lolol ol o ol ooll lolol ol o ollo lo ool olol ooll lolol ol o ollo lo ool olol ooll lolol ol o ollo lo
It was the best of times, it was the worst of times.
ool olol ooll lolol ol o o ollo lolol ooll lolol ol o ollo lo oll lolol ooll lolol ol o ollo lo oll lolol ol o ol ooll lolol ol o ollo lo ool olol ooll lolol ol o ollolol ol
o ol ooll lolol ol o ollo lo ool olol ooll lolol ol o olloool olol ooll lolol ol o ollo lo ool olol ooll lolol ol o ollo lo ool olol

H-Viewing


It was the best of times. It
It was the worst of times.


It was the best of times.
It was the worst of times.

Transpointing Frames



xacm

1965 Z-ps
1967 windows

FEB 26 1995

xacm

SELLING
MEDIA
ON
THE
NETWORK

FEB 21 1995

xacm

A rich design
which bears
continued
discussion

FEB 21 1995

xacm-
TC

R to d syst to
REWORK
EVOLUTION
[illegible]
INTERCOMPARISON.

FEB 21 1995

xacm

Like Web:
many-to-many
network
nomadic pub

FEB 22 1995

xacm

hyperarchival
[illegible]
[illegible] [illegible]
[illegible]
[illegible]

FEB 27 1995

~~CROSS-FILES??~~ xacm

Cross-~~fire~~ FILING
was
[illegible]

FEB 27 1995

xacm

Ec vs fed
[illegible]
[illegible]

FEB 22 1995

Group HYPERTHESIS ~~[illegible]~~ xacm

[illegible] & ~~[illegible]~~
more [illegible]

FEB 27 1995

Xsch. virt

dig costras

FEB 2 1 1995

xach

EMBEDDED
INSTANCES

FEB 2 1 1995

NX

xach
XU

INTERPENETRATING
EXPLORABLE
WORLDS

FEB 2 1 1995

xach

Hard to track ~~edits~~ edits
in order to ~~maintain~~ maintain
consistency
of ~~editions~~ editions

FEB 2 1 1995

xach

Detached portion
retains its connection
to the conglomerate.

FEB 2 7 1995

XACH

Zip. of *bib*

"may need be
just one of"

FEB 2 3 1995

xach

A surprising
number of facets
(which
I could not
explain well
before
partly because
of some of them
unified
it could not
separate them
in my mind).

FEB 2 0 1995

xach

LIKE DOUG'S,

A SIMPLE
UNIFIED IDEA
THAT THE EXISTING PIECES
SCARCELY
REPRESENT

FEB 2 6 1995

Xtcm:
MEDIA MODEL

Xrch

Lord-pea model

Cloud-media model

FEB 20 1995

WEDGE WOOD
VASE:

xatch:
UNTERFACES
& VINO

'Interface' — xatch
notes send
for
or give
weapons sytm,
but not for
office equipment
or medical,
kinds of ~~whose~~ [illegible]
often, [illegible]
[illegible]
(is nothing)

FEB 20 1995

(Vinny) xatch
wn — SSH (— DB
DECLINING [illegible]
CONTAINING
1 SIM OR PMTR,
[illegible] all 99%
& [illegible]

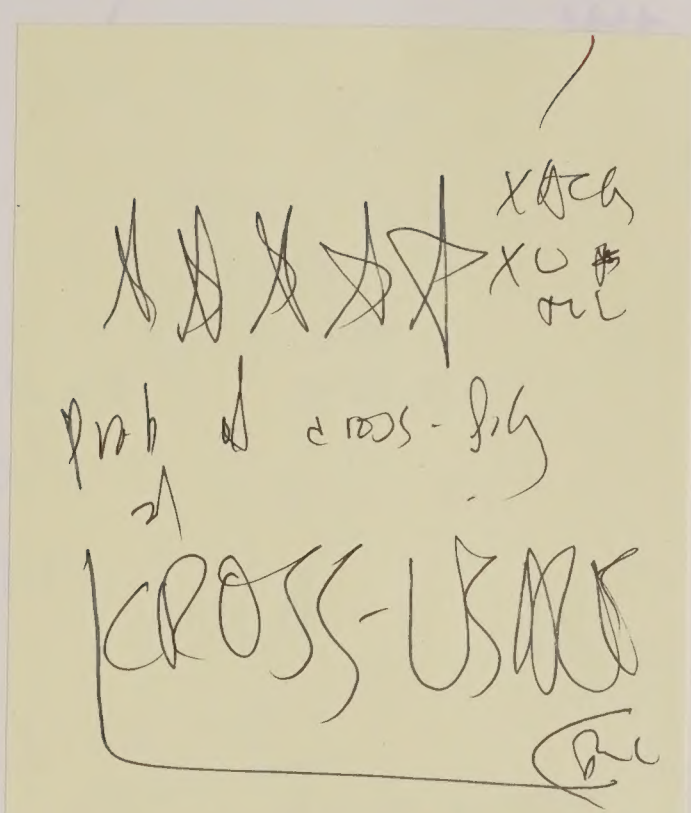
FEB 20 1995

'interfaces' xatch
for cars & weapons

FEB 20 1995

XJCM:

~~FIRST~~ PROBS. FIRST SEEN



JAN 1 1 1995

Esp. OPTIMIZING
cross-usage.

XACH:
~~FIRST~~
PROBS.
FIRST
SEEN

XACH

Today's HT
is like the
GO-TO-~~[illegible]~~ based
spaghetti code
that Dijkstra
criticised.

JAN 31 1995

XACH

HT JOB ISSUES
without
centralism
volunteerism

JAN 18 1995

XACH

NO SPECIAL-CASE
LINKS
(sticky notes,
directories...)

JAN 14 1995

Xach:
HT
ISSUES

~~[illegible]~~ Xach

MAJOR ISSUES

[illegible]

~~[illegible]~~

Control

stability

~~[illegible]~~

(CD)-ROM vs WWW
as extremes

~~[illegible]~~ & other

~~& others~~

JAN 15 1995

[illegible]

HT:
Printer's Box
and
vast ~~[illegible]~~ NO.
OF ASPECTS
+ PROBLEMS
People get too quick
an impression,
don't
see it all

JAN 16 1995 JAN 16 1995

[illegible]

XACM

Pocket

channel

~~channel~~ surf [illegible]

products

chimpanzee? hyperverse!

post-ad-click

of collect souvenirs

~~[illegible]~~

that serve as

~~[illegible] serve~~

re-entry stubs

~~[illegible]~~

FEB 18 1995

XACM

OPEN-USE ROYALTY POOL

NOV 3 1994

XACM

New [illegible] doctrine

JAN 27 1995

1960

XACM

A vast new unified system & interface

JAN 30 1995

XACM

★ ★ ★ ★ ★

FRAMING

FEB 16 1995

XACM

A method of quotation AND PERMISSION FOR THE METHOD

and commitment to keep the method ~~[illegible]~~ available.

FEB 9 1995

XACM

UNBOUNDED MEDIA SPACE

of

DEFINED AND OWNED OBJECTS

DEFINED AND OWNED FRAMEWORKS

FEB 16 1995

XACM =
PUB.
WORLD

XANADU
PUBLICATION SPACE
FEB 14 1995

XACM
XU

AN ARCHIC
BOZAM
OF
MATERIALS,
JAN 14 1995

XACM

OPEN RE-USE
JAN 14 1995

XACM
XU

TRANSVERSE
(4.)
the transclusive
document.
TRANSMEDIUMVERSE?
JAN 17 1995

XACM
XU

MEDIA OBJECT
★ LOCKED
MEDIA OBJECT
FEB 5 1995

XACM

THE TRANSCLUSIVE
~~UNIVERSAL~~
METAMEDIUM.
JAN 11 1995

XACM

this works
for software as well.
JAN 13 1995

XACM

Artwork can suggest,
based on prestige.
JAN 16 1995

XANADU =
PUB.
WORLD

XOCM
CC
XO

the transclusion

[unity]

net ≠ media

I Love

[so long many years

envisioned

XANADU MEDIUM

JAN 1 1 1995 TMC

XOCM

[TRANSCLUSIBLE]

BOILERPLATE

JAN 1 4 1995

XOCM XOCM
TRANS ©

XU
TMC

*OPEN-USE PUBLISHING

TMC
TMC?

OPEN-USE
TRANSCLUSIVE ROYALTY
PUBLISHING

NOV 4 1994

THIS ©
XOCM

A project of convergence of copyright of permission.

JAN 2 0 1995(1)

XOCM
TCL
TMC

NONPREFERENTIAL
RE-USE
AND REPUBLICATION.
TMC

JAN 1 2 1995

XOCM
INFO
SP

LAYERED
OVERVIEWS
COMPETITIVE
OVERVIEWS
COMPETING
LIES OF
THE SAME
MATERIAL

NOV 3 0 1994

ALL MATERIALS

JOIN

RE-USABLE

POOL.

DEC 2 1994

RE-USABLE

WITHOUT

DEC 2 1994

INTEGRATED

BUYER

AND SELLER.

DEC 2 1994

Summary for brochure or pocket at.

DEC 2 1994

to

buyer

seller.

ALL MATERIALS

MAY BE

RE-USED

ACCORDING TO

AN EXACT

understanding

DEC 2 1994

RESALE OF THE ORIGINAL

XOCA

Stabilized publicly
under secure auspices

JAN 1 2 1995

XO

XO vs T-W:

PEOPLE
WANNA
KEEP STUFF!
(Videotapes...)

JAN 9 1995

XO LOYALTY:

XOCA

implementable
clear
simple
fair

NOV 1 8 1994

XATCM:

~~Tools~~

Probs w
NN sys ts

Trans ©
XATCM
TCL
xu.tmc

TRANSVISIBILITY
tmc

~~Parameters~~
specifying
what can be seen
beside
the original.

JAN 19 1995

XATCM
Trans ©

Publishing model
staged sys

JAN 27 1995

xatcm
TC ©

2 permission
doctrine
2d software to support it
Commitment to ~~publish~~
keep trusted DB

FEB 9 1995

XU vs SH-W

PEOPLE
WANNA
KEEP
(video

XU ROTATE:
implementable
clear
simple
fast

NOV 1 8 [illegible]

XACM:
VIRT

XACM

CONCEP. STRUCT
OF SW
ARE ARBITRARY

24 hr lightly explored.

FEB 6 1995

#F2
TCL
IF2

TRANSPUB

~~TRANSPUB~~

'Now you're going to have

~~I Now you'd~~
~~going to have~~
~~the da Vinci book~~

the da Vinci book
open,

~~open~~

~~and no other!'~~

not no other!

DEC 14 1994

TCL

Fulfillment
could also be called
TRANSSUBSTANTIATION!

JAN 9 1995

TCL Lit

A SINGLE POOL

DEC 31 1994

XuPub

Since [illegible]
going
[illegible]
determination ~~[illegible]~~
~~for~~
for the network or site.

DEC 1 1994
/61.4

XU
TCL

FULL-DUPLEX
TRANSCLUSION

NOV 6 1994

HT

SO MUCH COULD JUST
BE PAINTED ON
A BIG POSTER!

NOV 24 1994

(notably piece to Transcopyright?) WRI

PUBLICATION
AND
ELECTRONIC PUBLICATION
PUBLICATION
AND
ELECTRONIC TEXTWORLDS

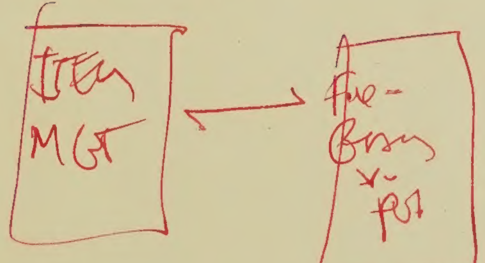
JAN 13 1995

XACM
from other projs. & T[illegible]

d4 TCL
BROUGHT FROM
SAME SOURCE [illegible]
MORE THAN
ONE CONTEXT
DEC 1 9 1994

XU
Quantum Quote [illegible]
OCT 2 4 1994

[illegible]. TCL
being able to use
the same thing
in many places
by ~~[illegible]~~ pointing at it.
JAN 1 4 1995

TCL
C[illegible]


NOV 1 5 1994

XU
ZIP.ED
EU
&
[illegible]
of ITEMS
NOV 1 2 1994

TCL
TRANSPUB
XU [illegible] Makes.
varies by
~~[illegible] by~~
VISIBILITY
~~[illegible]~~
GRANULARITY
~~[illegible]~~
DEC 2 1994

ZIP.ED
NONLOSABLE ITEMS
NOV 1 7 1994

NOW: TWRG:
TCL
TRANSCLUSION
AND
THE UNIFICATION
OF THOUGHT

NOV 1 7 1994

XuPub

RE-USE POOL

allow
EVERYTHING TO BE
MERGED.

DEC 1 1994

XU

STABLE
PUB. SYST
NO PERMISSION
TO QUOTE
MICRO-TCL

OCT 1 7 1994

TCL
TML

TRANSCLUSION
PATH

NOV 7 1994

XuPub

PAY WHATEVER
YOU LIKED RESULT:
phone call
photocopy
(Jobl C's
example)
~~card~~ card but
(but not
Restaurant meal)

DEC 1 1994

TCL
XU
IPR.

larger pool
of
co-availability
and
paradigm control
TO REDUCE
FLAMING.

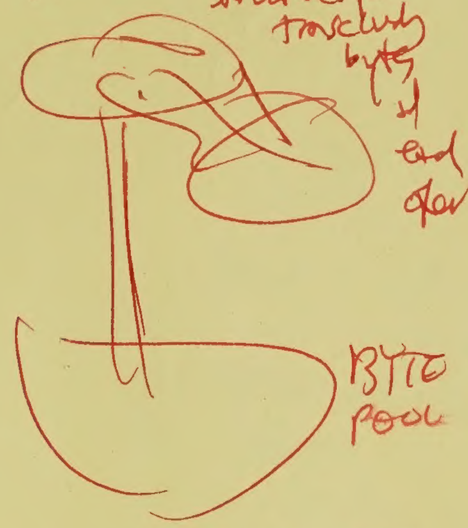
DEC 2 2 1994

XuPub

Guaranteed re-creation of events in the system

DEC 1 1994

★ XACH



FEB 7 1995

XACH
PIX

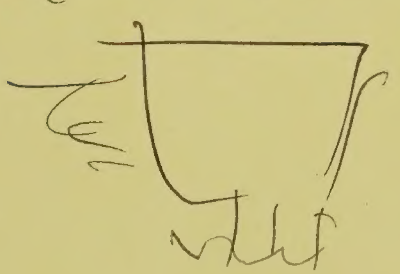
XuPub

DISSIMILARITIES
- free look
- up-front licence

DEC 1 1994

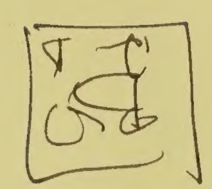
Readdr.
~~Readdr~~, box

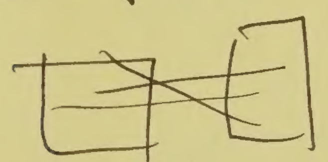
X OCH

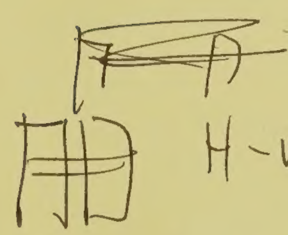


JAN 1 0 1995

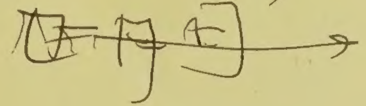
XACH
PIX



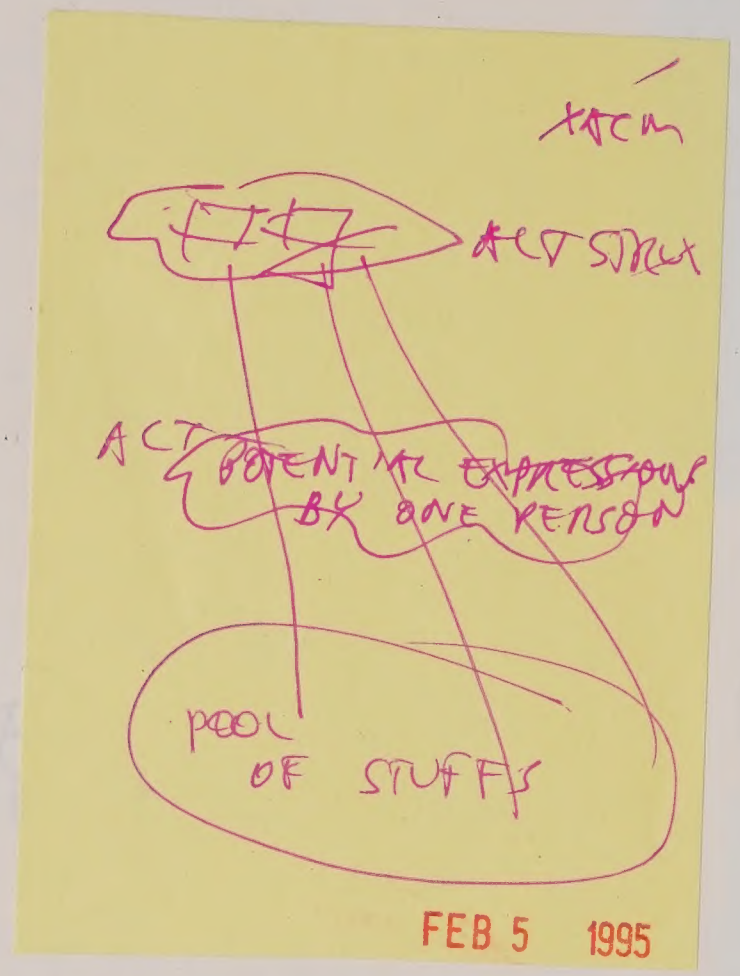


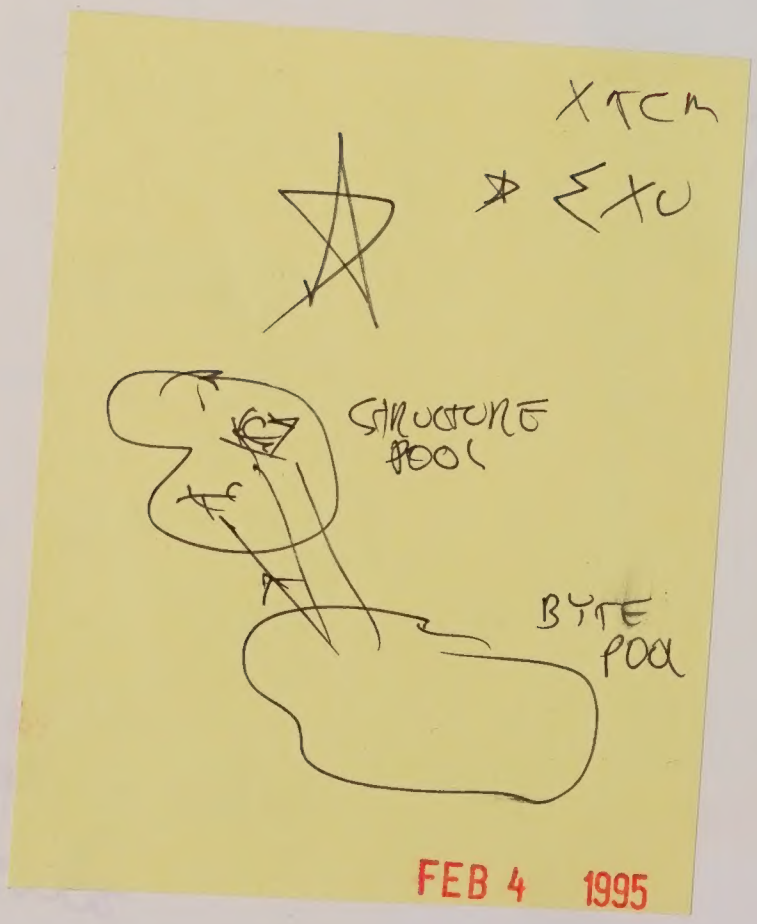


Transclusivity



FEB 1 8 1995

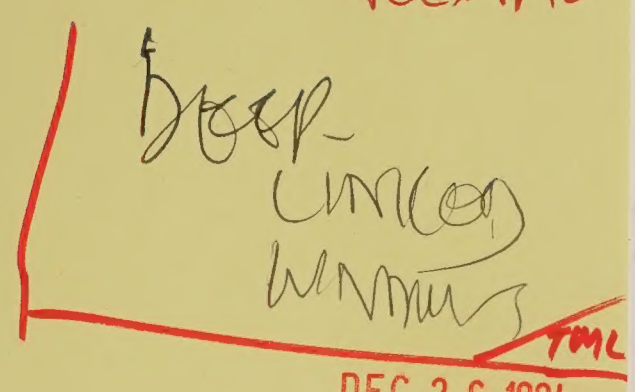

ACT STRUCT
ACT POTENTIAL EXPRESSIONS BY ONE PERSON
POOL OF STUFFS
FEB 5 1995


STRUCTURE POOL
BYTE POOL
FEB 4 1995

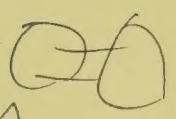
NELSON -
WINDOWS

NELSON - ~~WINDOWS~~
WINDOWS
JAN 1 2 1995

TCL TML



DEC 2 6 1994



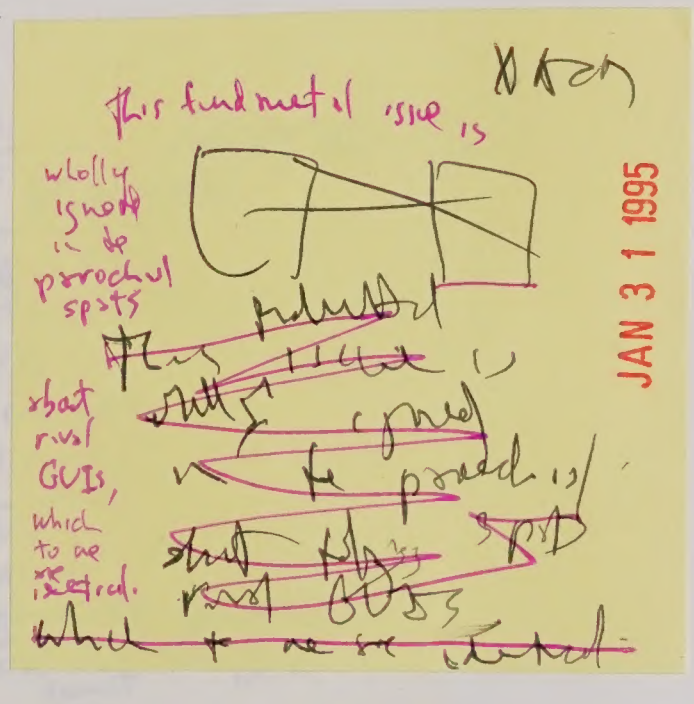
Note that these point-out lines ~~will follow~~ will individually follow the contents as they scroll or write.

FEB 1 0 1995

XU TML

TRANSVERSE VIEWING OF COLLATERAL HIT
(transclusive or counterpart)

JAN 1 9 1995

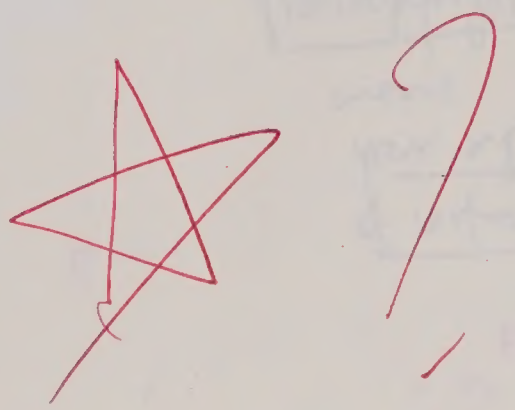


Nelson - Windows

XU TML

INTERNAL COUNTERPART WINDOWS

FEB 1 9 1995



XU BASICS XCOSM XU

How DIFF FROM WWW

~~XU BASICS~~ Versioning, Delta List

Re-Use

Transclusion

Copyleft

PUBLISHING

COPYRIGHT

FRAMEWORK EQUALITY

UNIVERSE EQUALITY

ANYONE MAY PUBLISH AND REPUBLISH

Document

Creative Filter

LOST IN HYPERSPACE:

~~Search Universe~~

Surf Universe

JAN 10 1995

EMN trans ©

The objective is
free re-use
in any context
with credit
no misquote,
with out of context

This gets
appear to recognisably
may be a singularity
in design-space

JAN 17 1995

XA CM
trans ©

In many situations,
the proposed honest solution
is
INCONVENIENT.

JAN 27 1995

© XU XACM

XU - ONLY TECHNICALLY
IMPLEMENTABLE
WAY OF
SIMPLIFYING
COPYRIGHT
WHICH ALLOWS
RE-USE.

NOV 18 1994

SHORT FORM OF CONTRACT ~~XU PUB~~

Pocket ed
X. Cotton

"You are
free to copy
if you just
publish the pointer.
~~the pointer.~~
That way
he buys it
and we're
all happy."

DEC 7 1994

Contrax ms - XU XACM TRANS©

simple
legal
acceptable

NOV 17 1994

XACM:
TRANSPUB.

XACM
~~[illegible]~~ TCL PUB
best ~~[illegible]~~ understood as
system for safe
of permission
PERMITTING
UNLIMITED
RE-USE
IN
REPUBLICATION,
with purch.
of each piece
from orig. pub.
by each user.
JAN 11 1995

XACM
~~XACM~~
TRANSSUBSTANTIATION
~~[illegible]~~
JAN 12 1995

Trans©
transCOPYRIGHT
RIGHT to COPY
virtually
of virtually Republishing
by transclusion
pointer
FEB 6 1995

XACM
TCL
TCL PUB & REPUB
Bytes [illegible] [illegible]
of available by them
all permitted ~~[illegible]~~ virtual repub
(transpublication) =
bytes of others not transmitted
by republisher
but sent as others' [illegible]
for independent repurchase
by receivers
ORIG BYTE PUBLISHER
DOES RELINQ. CONTROL.
FEB 18 1995

XACM
Trans©
Transcopyright
means
your right
of virtual republication.
FEB 6 1995

XACM
TCL
Transmission of
SKELETON
FRAMEWORK
STRUCTURE
FEB 16 1995

H-VIEWING

XRCM
XU TML

JAN 12 1995

TCL ☆ XU
TML

TRANSVIEWING

JAN 17 1995

XU
TML

H-VIEWING

~~H-VIEWING~~ TML

H-STUDY

JAN 14 1995

XSCM:

H-VIEWING

feko

XSCM

TCL

TML

H-VISUALIZATION

TML

JAN 1 2 1995

XU

TML

H-VIEWING

~~H-VIEWING~~

TML

H-STUDY

JAN 1 4 1995

XU

TML

*TRANSVERSE

CO-VIEWING

TML

JAN 1 7 1995

XU

TML

*TRANSVERSE

CO-VIEWING

TML

JAN 1 7 1995

TCL + XU

TML

TRANSVIEWING

JAN 1 7 1995

XACH

FINE-GRAIN
EDITABLE
~~EDITABLE~~
embedded ~~[illegible]~~
instances

FEB 18 1995

XACM

Most people
we now
up to speed
on these matters

and so many suppose
[that XU exists]

JAN 11 1995/p. 1/2

XACH

XU
TML

BASAL ADDRESSES
~~BASAL ADDRESSES~~
BASAL
~~[illegible]~~
SECONDARY
ADDRESSES

JAN 21 1995

XACH

XU ☆
TML
PANVISIBILITY
~~PONVISIBILITY~~

DEC 1 1994

XACM
Servers

Var. gram
& vis.

TCL 88. TCL XACM
VISIBILITIES
TML

→ See ~~orig.~~ orig.

See end

[re-use]

occurrence
~~re [illegible]~~
~~account~~

TCL XOC servers
THE ABOVE, AND:
→ See end

CONTEXT ~~[illegible]~~ CONTEXT
FROM WHICH ~~[illegible]~~ TML

NOV 8 1994
/P.95.1.9

Principal legacy Variation XACM
~~[illegible]~~ on [illegible] ~~[illegible]~~
[illegible] [illegible]
re ~~[illegible]~~ mostly
VARIETIES
OF
GRAMMAR
AND
VISIBILITY
~~[illegible] uses~~
AMONG USES

JAN 1 1 1995

XACM
TXL XU

Zipper list

→ [illegible] [illegible] [illegible]
TML

NOV 1 8 1994

XU
TML

~~UNTRAMMELED~~
UNTRAMMELED
UNFETTERED
~~[illegible] [illegible]~~

OPEN
RE-USE

JAN 1 4 1995

XACM
XU

SECURE
~~SECURE~~
ITEM CONTROL

JAN 1 2 1995

Trans©
XACM
republishing
~~republishing~~
virtual

JAN 3 1 1995

No, it's REAL repub by virtual transfer. / 8.95.2.x TNL

XACM
EXO
TNL

transclusion
with automatic
permission
and automatic
royalty

NOV 2 8 1994

XU
TNL

PUBLISHING
SERVER

— [illegible]

OCT 2 7 1994

XACM

The sea of documents
~~documents~~
is sargasso —
~~[illegible]~~

— how ~~unify~~ them?
unify/them?

JAN 3 0 1995

Representation
[illegible]
XACM
[COMPOSITE]
[CATERED
catenated?
STRUCTURES
& PRODUCTIONS
(eg. audio mixes,
video cuts,
Live Return Input)

JAN 2 3 1995

XACM
Trans©
PN
trans-miscible
TNL

FEB 5 1995

XACM

~~TEMP~~

~~Posted 95.5~~

Posted 95.2.19

XACM

I repudiate the widespread claim that "the technology had to be ready." The technology was always ready.

FEB 19 1995

XACM

STRUCTURE ⇄ CONTENTS

FRAMING ⇄ BYTES

FEB 16 1995

XU
TCL
TML

TRANSVERSION

(Transverse viewing)

TRANSVERSIONING

TML

DEC 29 1994

XACM

The original identity castrates a path to the original.

FEB 19 1995

TCL
TML

Document filled is REMOTE
-NOW

IS

NOV 8 1994

XACM

Attempts to standardize PIECES AND CHUNKS of information that could freely (and safely, without ~~hope~~ fear of deletion) be passed around

FEB 5 1995

XACM

FINE-GRAINED VERSIONING

JAN 20 1995 (2)

(Realization (hearing Masuda's lecture)

XOC server

ARB SPACES
for mapping
of { initial material
re-uses
filtering

FEB 6 1995

XACM?

CO-OPT ← TIME
for
transclude.

JAN 27 1995

XACM

BYTES
VS
DISTINGUISHED
SECTIONS
AND PIECES.

JAN 23 1995

XACM

Outraged by the "clipboard"
and "garbage can,"
and the simulation of paper.

FEB 6 1995

XACM

(things trying to unify)
WP
HCD
WWW

JAN 27 1995

XACM

How to develop ~~[illegible]~~
(eg HT, HM, link, transclusion)

JAN 12 1995

XACM
TCL

TCL = PUNCH-THROUGH

JAN 14 1995

XACM

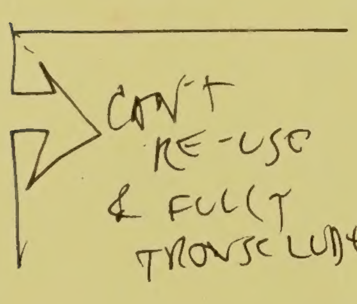
Fine-grained servers
with
ARB. TRANSCLUSIONS.

FEB 8 1995

XACM

IMPOSSIBILITY OF
EMBEDDING —

~~[illegible]~~
Anchors
SGML



CAN'T
RE-USE
& FULLY
TRANSCLUDE

FEB 6 1995

XACM

Need for stabilized
long-term publishing

I believe Flaming
is a result of
the exaggeration-of-the-Now,
together with disturbingly
uncertain
retention policies.
"publishing" is a unfortunately
a well-defined interphase
which must be
understood &
carefully established.

JAN 12 1995

FEB 7 1995

XACM

maintaining
~~Maintaining~~ the
"current state"
is just surface
surface

FEB 7 1995

Corp. heroes were
~~[illegible]~~
[illegible]
Sutherland & [illegible]

XACM

JAN 1 1 1995

~~XACM~~ XACM

STEREO

JAN 1 1 1995

XACM

people think 'it exists'
WB, ~~[illegible]~~ [illegible]
[illegible] pub, [illegible] int SW...
'[illegible]' — [illegible]
[illegible] its ~~[illegible]~~ [illegible]
[illegible]

JAN 1 0 1995

XACM

~~Over~~ 20 yrs
before ~~[illegible]~~ discovery
ends (w Rick, David, Tom)
— still unpublishable
~~X [illegible] K.E. Drexler~~

JAN 1 0 1995

XACM

Copyright [illegible]
is [illegible]
separable
from implementation,
of a [illegible] -
[illegible] SGML
[illegible]
[illegible]
even possible ~~[illegible] [illegible]~~
~~[illegible] [illegible]~~
wit WWW

JAN 1 1 1995

XACM

Mark's [illegible] 88.1 —
very [illegible] -
[illegible] [illegible]
[illegible]
[illegible] by a
~~very [illegible] [illegible]~~
very fine designer.

JAN 1 0 1995

XACM

Posts, also [illegible] [illegible] [illegible],
'[illegible] is slow business'

JAN 1 0 1995

JAN 2 7 1995

FEB 3 1995

XAICM
passed
95.2.19

HYPERTHESIS → hwd

xacm

DEC 7 1994

XACM
XU

hypertextual structure

for multi re-use

(SGML & HTML

exactly wrong, ~~exactly wrong~~,

but could be ~~but could be~~

easily separated out

— parallel

PGML

JAN 1 1 1995

DEEP REMIX

& simple ideas (JCL PUB)

XACM

JAN 1 1 1995 r. 12

XACM

piece pod
one master copy
JCL (define

JAN 1 0 1995

XACM

WRI

SOFTWARE DESIGN:

the Art of Virtuosity

NOV 1 5 1994

XACM

B-Lee's

~~B-Lee's~~ supposedly clean

simplification ~~simplicity~~

of XU

JAN 1 1 1995

stereo

XACM

JAN 1 1 1995

XACM

XU

ARES AMONG XANADUS

Granularity

Covisibility among transclusions

Context capture

JAN 1 3 1995

MJAX
b2259

XACM

~~Compliment~~ Copyright B-lee

JAN 1 1 1995

XACM

These are the details, as I have worked them out.

JAN 1 3 1995

XACM

Cop. - World

COMPARING VERSIONS
requires ~~all one's~~ all one's concentra

JAN 1 3 1995

XACM

Corp. virt doct

JAN 1 0 1995

XACM
Trans©

Illicit use -
is problem for
ALL
DIGITAL MEDIA.

JAN 1 1 1995

XACM

Certain on Transclusion..
Those w/o really think
"Xanadu exists"
(which a journalist recently claimed,
obvious
having been so told),
are unaware of transclusion.
(And that "Xanadu" is my registered trademark.)

JAN 1 0 1995

XACM

OC
~~JOL~~

NO GOOD MOVEMENT OF POINTS MOVEMENT
~~NO GOOD~~
~~MINIMUM~~
~~UP PUBS~~
~~SET PROG~~
~~SET~~ best PROJS

NOV 8 1994

XACM

Virt as model of film

FEB 6 1995

TCL

XACM

like the
one-eyed bandit
ROW OF FRUITS.

NOV 9 1994

XACM
UNALLOCATED
passed

XACM

HTML is the alternative:
the same
disembedded
sets of codes,
disembedded,
so that more than
one set of codes
can be used by
one or more users.

JAN 1 2 1995

XACM

late-breaking negotiations
and
just-in-time
decision-making
on creative property;
but a system
that would juggle
and keep clear
the relationships
among alternative
designs, scripts, etc.
at the same time.

FEB 4 1995

XACM?

MW. CLIENT.
TWO-NAMES (M.I.)
& RECEIPT

While perusing
either document
YOU WON'T HAVE TO
BUY IT AGAIN.

JAN 2 7 1995

XACM

liquid digital
docs
& not
paper form.

JAN 2 6 1995

XACM

Documentary transformations

malleable,

plastic,

~~[illegible]~~

fluid

JAN 2 0 1995 (2)

XACM

Pub. Docs

XACM

~~[illegible]~~

CD-ROM vs WWW

~~[illegible]~~

[~~[illegible] vs WWW~~

Need ~~[illegible]~~

pub text's ~~[illegible]~~ stable,

can be changed

but still

locks in

one config bytes

JAN 2 7 1995

Working on diff versions of SW continuously for over 30 years

JAN 2 7 1995

XACM?

Trying to establish

a ~~[illegible]~~ deeper

syst of order

~~system of [illegible]~~

non sequence of hierarchy,

~~[illegible] sequence~~

~~of hierarchy,~~

[which will [illegible] replace the old.

which will deeply? replace? the old? world?

JAN 3 0 1995

XACM

TCL

~~[illegible]~~ was part of both Writer's Console & Pub Method,

JAN 2 7 1995

XACM

My concern for THE RIGHT WORD in order to focus a concept or a paradigm

FEB 4 1995

XACM

ALL PIECES ARE KEPT DISTINCT, though not necessarily on the screen.

JAN 3 0 1995

DOC[illegible] Godview xach
vs
DISAGREEMENT
hist
shared &
concep.
~~default~~ materials

JAN 30 1995

xach
/
TU
TCL

OVERLAY
REVISION

FEB 1 1995

xach

A world of separate
focused drafts
[illegible] [illegible] sense.
There is just ONE
BIG DOCUMENT-
IN-CHANGE,
& its history is part
of it.

FEB 5 1995

1960 xach

EDITED VERSIONS
TIED TO ORIGINAL

keep
Editors ~~Honest~~ HONEST

JAN 22 1995

xach
TCL

SPINDLES
& transclusion

NOV 5 1994

XTCH

APPLICATIVE STRUCTURES
~~with bytes as~~ applied to bytes, (& v. versa)

FEB 1 9 1995

XU XTCH

Grail Xanadu

Turing machine

NOV 2 8 1994

XTCH

XANADU
TRANSMEDIUM.

TMC
CC

JAN 1 2 1995

XTCH

I like Jefferson, I was a
elitist and
a populist —
"populitist" is my
preferred ~~term~~
term.

JAN 1 0 1995

XTCH

Xoc serves ~~the~~ represents XU

the thesis

a fine byte.

NOV 7 1994

XTCH

~~A~~ last, at thirteen,
~~at three,~~
~~at three~~ I daydream
~~of~~ my ship
in ~~my~~ our
~~my~~ earth satellite.
~~earth satellite.~~

JAN 1 0 1995

XTCH

Xu has always been
large-scale paradigm
with many ramifications,
thus difficult to encompass
though expandy from a
simple kernel idea.

JAN 1 3 1995

XTCH

XTCH

how to com[illegible]

JAN 1 0 1995

XTCH

Our large-scale
philosophical system,
which I have
criticized to work on,
as well as a
broad-scale alternative
system of social science.

JAN 1 0 1995

XTCH

my clear ~~poor~~ power of Viz

JAN 1 1 1995

XTCH

I by very clear ~~powers~~ ~~visualize~~ visualize of

JAN 1 1 1995

XTCH

I by al uncommon ~~ac~~ clear sense of ~~lead~~ of initiative ~~enterprising~~ & capability

my ability al understanding ~~ac~~ ~~ability~~ & clarity

(since the age of 11 I had believed most people were fools.)

~~and~~ JAN 1 1 1995

Received Rec idea XTCH

~~Record~~ ~~Rec~~ ~~Mes~~ & des-

from others.

JAN 1 1 1995

XTCH

Interm - autistic . des of HUMAN CREATIVITY & cosmic controversy

JAN 1 1 1995

XTCH

or ~~Print~~ / IMPORT

ADD TO COMP'S TERMS

"Hypertext," "hypermedia," "visualization" ... "cyberspace," "virtuality," "wonderful" "dilations" & "technol."

FEB 6 1995

XTCH

I was always commercial; always disliked the pretty ac constructs of the nonprofit world, ac believed that good works could & only come from independent wealth & initiative.

FEB 4 1995

XTCH

I had done a fair amount of hooker

FEB 4 1995

XTCM

A WORD CHANGING

FEB 9 1995

XTCM

ADHD

JAN 13 1995

XTCM

Writer
Movie maker

JAN 27 1995

XTCM

SWEEPING PARADIGM

JAN 12 1995

XTCM

Particular dislike for AD,
since RD (real disability)
is too low new
its yuppie.

FEB 9 1995

XASCM

RETURN TO
STICKIES DOOR
(unless taken from XASCM)

MSAY

I believed that only be
~~independent~~ very well
or be very defiant
could do
original creative.

JAN 1 0 1995

I wanted to do
all my projects
in what
we may call
massively parallel
fashion.

FEB 8 1995

RETURN TO SOUP

/

~~LEXICON~~

THE ART OF CONNECTION,
THE HEART OF ~~PERFECTION~~ REFLECTION,
THE HOPE OF PERFECTION

FEB 5 1995

/

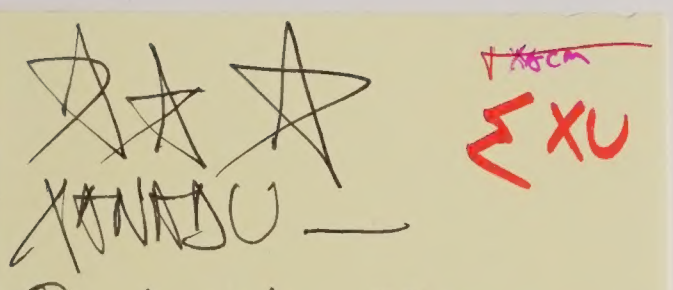
~~LEXICON~~

~~Because~~ I personally loathed
editors, committees
and collaboration of any kind —
which require
exhaustive enumeration
and explanation of
every conceivable nuance,
thus ~~[illegible]~~ limit
the number of conceivable
~~[illegible]~~ possibilities
to very small number
and waste effort in unnecessary
communication.

FEB 4 1995

XACM:
XU
+JUMB

PDGM ①



+XACM
EXU

① A single-user
interemprism
in
project evolution
environment.

② A new kind of literature
with bridges of
linkage in command ①,
~~ext~~ based on ~~to first~~ ①,
designed for universal
instantaneous access
in open publication
by all
with copyright held
in public domain.

NOV 6 1994
NOV 5 199

Deep-connected nodes
MUTUALLY
COORDINATED
VIEWS AND OVERVIEWS

+XACM
XU

JAN 1 6 1995

+XACM
TO
OVERCOMPING
USERS

for
DIGITAL
PUBLISHERS

NOV 6 1994

MAX
UX
.dwarf

XACM:
PDGM ②
~~RE-USE~~

~~XACM~~

RE-USE MATERIALS
AS IDEAS
CHANGE

FEB 6 1995

1960.

~~XACM~~

*EAU

SIMULTANEOUS
DIFF
ARRANGEMENTS
OF
SAME MATERIAL

NOV 29 1994

XACM:
POEM (3)
ALTS

~~XACM~~

CONTENDING
POINTS
OF VIEW

FEB 6 1995

~~XTACH~~ XU

Control Model:

ALT STRUX

USE SOME MECHANICS shown

SIDE BY SIDE

FEB 6 1995

~~XTACM~~:

PDGM (4) ~~NEW~~

ALT VIEWING &

~~NEW PDGM~~

~~XTACH~~ XU

GENERALIZED SERVERS TO SUPPORT

TRANSCLUSIVE INTERCONNECT

AS THE CONTROL OF ALL DIGITAL FUNCTIONS

FEB 6 1995

~~XTACH~~ XU

(VAX) general server for hypertexts & to control of everything

FEB 6 1995

VIEW LOOKING
AT
ISO
XRCW:

~~XACM~~:

PDGM (5)

LIVE-IN

FEB 12 1995

TECH:

PDGM (6)

WHOLE WORLD & CHANGES

DUE

TECH

Organizers are to

HIGHLIGHTING

OF SUBSTRUCTURES

FEB 9 1995

8 changes
More needed
below ⓑ
yours:

XUCM:
PDGM (7) change
by
Overlay

XU
TMC

Applicative changes
TMC

JAN 3 0 1995

PDBM ⑧ XTEM:
HT SIRUXX

SPL

~~Xtal~~

Give it ~~of~~ end al
~~al~~

sequence,

WHEN WHERE ~~ARE~~ BE
AND NOW SOLUTIONS
TO FACILITATE

PRESENTATION
(METRICS, relating
& CLARITY ~~RELATIONS~~
CONTROVERSY
~~CONTROVERSY~~
~~INFORMATION~~
INTERCOMPARISON

JAN 3 1 1995

?

FRONT-END ISSUES
GRADUALLY
PUSHED
OUTSIDE

No invalid views, test possible & strictly

BUT
MAINLY.

/95.2.19

XTCM
PDCm (9)
User
Sch Structures
w/.. Dex

XTCm

Version mgt
ITEm CONTROL

JAN 1 2 1995

REGISTERED
~~ROUNDED~~

~~XTCm~~

~~ROUNDED~~
~~UNDELETABLE~~
~~ITEm~~

UNDELETABLE
ITEm JAN 1 2 1995

XTCm

~~MANAGEMENT~~
~~VISUALIZATION~~
~~CONTROL~~
~~REPORTING~~
~~DOES NOT WORK IN OLP~~

(Doesn't work in OLP)

JAN 1 6 1995

XTEM:
ADGM (10)
TRANSCLUSION

TCL

TRANSCLUSION ≠ TRANSFER

NOV 2 1994

~~XACM~~ LIT

hypertext —
& huge new kingdom
(in the biological sense)
of literary genres,
of which the
previously ~~discrete~~ discovered
varieties of ~~sequential~~ sequential text
were only the smallest part.

JAN 3 1 1995

~~XACM~~ LIT
INFO

LIT
Ideas
Refer
Pres
~~Openly~~ Openly
Present!

NOV 8 1994

~~XACM~~
LIT

OPEN ANYTHING
AT ANY TIME
TURN TO LAST PAGE
USE THINGS TOGETHER
QUOTE FREELY

FEB 1 6 1995

KEEPING
ALL THE
PIECES
SEPARATED.

Each piece has a
POTENTIAL BACK
TO ITS ORIGINAL.

NOV 2 8 1994

XOU
BRIDGE
OF
CONTEXTS

OCT 1 8 1994

XOU
QUILT
Level

EMBEDDED INSTANCES
with IDENTITY
MAINTAINED
of
ORIGINAL
CONTEXT
AVAILABLE.

FEB 1 8 1995

EMBEDDED INSTANCES,
VARIANT
OF
NEW CONTEXTS

FEB 1 8 1995

~~XACM~~ EXU

Ⓐ ~~XACM~~

★ ★ ★ ★ ★ ★ ★ EXU

XU is a unified system

for version management,

~~[illegible]~~ hypermedia (e.g. transclusive, parallel, intercomparative — not yet described)

and a publishing system with a precisely-defined business method

and extension to copyright intended to free all materials for republication as quotations, ~~collage~~, anthology, collage and boilerplate,

JAN 13 1995

Ⓑ ~~XACM~~

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ EXU

but interfering with no other ~~copyright~~ aspects of copyright.

As a planned network it has been intended as a licensed or franchised network ~~under a~~

of servers and staff under independent local ownership with unified policy, ~~like th~~ and a high-grade uniform service, like McDonald's.

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Ⓒ ~~XACM~~

EXU

Xanadu has a long history of partial implementations, interesting both historically and ~~[illegible]~~ as computer science. Unfortunately a number of trade secrets of the project are still under wraps, owned by XOC, Inc. and licensed to Filoli, Inc, and the author. Some but by no means all of our special algorithms were discovered over twenty years after our discovery, but where they are published is part of the trade-secret package.

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~~+ACM~~ 1960, pre-1960 PROBS

~~+ACM~~ Trans ©

How in the integrated media universe will we avoid the godawful permissions problem?

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~~+ACM~~

How support self-pub?
How support freedom of express.-?
How fight the evils of ~~Fahr~~ 1984, Fahrenheit 451, "F for Effort"?

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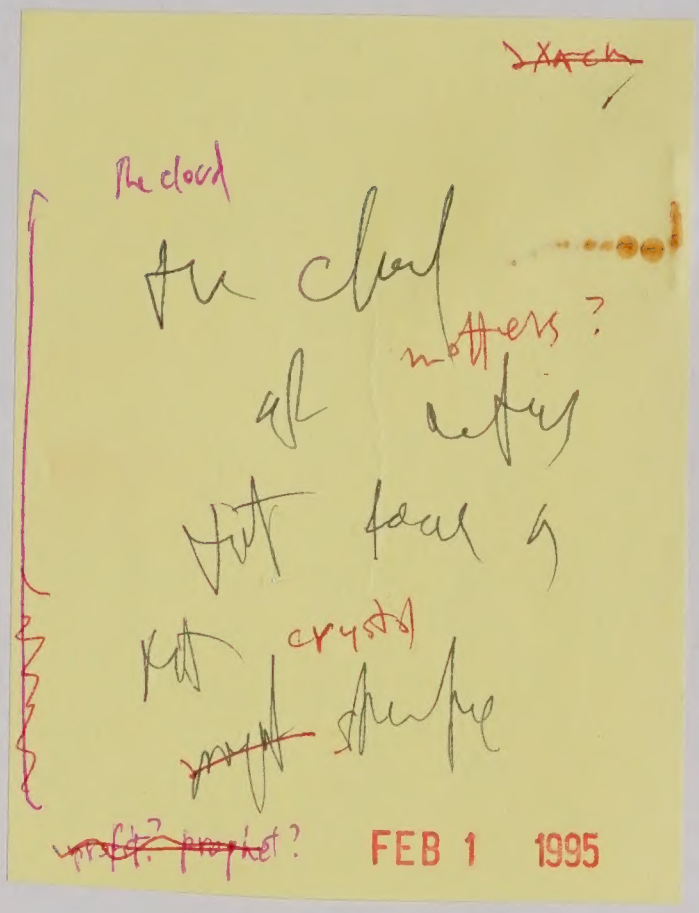
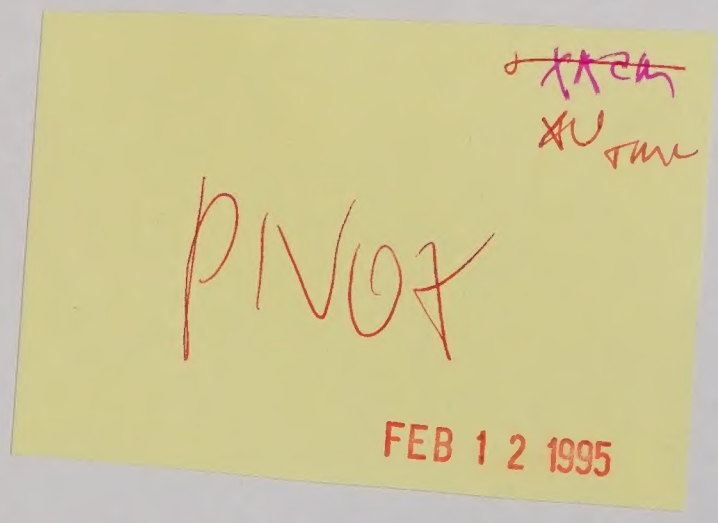
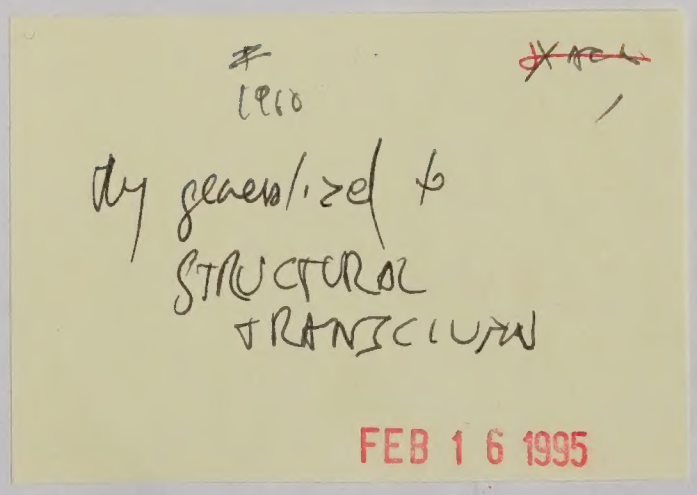
1960/ Today ~~+ACM~~ /

JCL

was/is the Quark Level of

Item Control & Mangmt
Cross-indexing
Intercomparison
Alternative Organizations of the same
Re-Use
Versioning & Item Mgmt
QUOTATION & COPYRIGHT IN ELECTRONIC PUB.

OCT 2 4 1994

Xtal:
Convergence